..THE IRON AGE..

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HOW ARMCO MEASURES THE WORTH OF ITS MEN

By C. H. MURRAY
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THE American Rolling Mill Co. conducts an annual "personnel audit" designed to point out the relative abilities of its employees, from laborer to works manager, so that the management has constantly available an up-to-date inventory of the personal characteristics and the progress being made by its men. This audit is of special benefit during peak periods, when the organization is expanding, or in times of depression, when the number of workers must be scaled down. This article, written by the man who introduced the system at Armco and has supervision over it, tells how Armco has used it to practical advantage over a span of eleven years.

ON Aug. 1, 1920, Henry Ralston went to work in the Goshen plant of the Rapid Rolling Mill Co.; on the tenth of the same month Sam Walters started in at its Martindale plant. Had the two men been sized up, side by side, by a skilled employment interviewer, he probably would have made the following notation:

"Both good men; little difference in their qualifications."

Yet ten years later we find that Henry is superintendent of the shipping department at Goshen, while Sam, by virtue of long service, is only an inspector over at Martindale. Why?

You can write your own answer; even if we possessed all the intimate details of the case, no two of us would exactly agree. However, on this one point I do not believe there would be any diversity of opinion:

Assuming that Henry's success was deserved, and that Sam's native intelligence and education, his capacity for work, and other qualifications, actually were the equivalent of Henry's, then the Rapid Rolling Mill Co. was the loser. A good man was wasted. We might also be willing to place the responsibility for Sam's apparent failure on the company, because it did not provide some plank in its organizational structure for recognizing and making use of the human qualifications it had had at its disposal during the ten years of Sam's employment.

There are many Henrys and many Sams in every organization, large or small. In the large decentralized company it is

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much easier for Sam to become "buried," unless he happens to possess sufficient resourcefulness and showmanship to attract attention. But even in the small organization, where the manager knows every one by his first name, and sees him every day, the Sams are not a rarity, because the selection of the man for the better job is based to some extent on superficial evidence, or on seniority.

Annual Auditing of Personnel

Years ago, bookkeeping was created to provide management with financial records. Later came the audit, as a check on the adequacy and exactness of the accounting, and also as a means of establishing public confidence in the enterprise. I do not mean to imply that human characteristics can be tabulated in red and black ink as the accountant records dollars and cents transactions. However, personnel records keeping is somewhat comparable to bookkeeping. Applying the idea to include an annual audit of personnel simply requires compiling the information on the organization into a usable form which can be adapted to many purposes.

The principle of auditing human qualities is not new. Industry has used its fundamental principles for ages. The small sheet-metal contractor who employs two workmen unconsciously utilizes certain auditing principles, though without a formal plan, when he delegates tasks to each of them. His managerial sense dictates that he assign to each man the task he is best qualified to perform. He mentally audits their respective abilities, and then decides.

A further development of the fundamental principles of the human audit, or as we at Armco prefer to call it "the personnel audit," is the organization of a system which provides for fact-gathering, compilation, and the proper utilization of the facts. Though no system has ever been devised which will measure efficiently human characteristics, it is surprising the great amount of information about persons employed by any company which can be uncovered and made available by a simple personnel audit. Designed primarily to point out the relative abilities of the individuals and to prevent the channels of progress from becoming clogged, it refreshes the mind of the immediate supervision regarding the capabilities of the men under it, familiarizes the personnel division with the character of the employees, and is a factor in many other organization matters.

It is logical that a personnel audit would be of special benefit in peak periods when an organization is rapidly expanding, or in periods of depression when it is contracting. In both situations, that vital and intricate problem of placement, or removal, of men must receive intelligent and serious consideration because it exerts a powerful influence upon making better product at a lower cost. When the business is growing, management should be assured that its organization is of the proper caliber before any important extensions are effected. Just the reverse is true when it is necessary to pare the organization. It is good business to keep only the best men, but nepotism, religion, social and fraternal connnections, friendship, in many instances leave the culls on our hands while the good men are released. Of course, the employment department is designed to frustrate such shortcomings, but sometimes the employment man does not possess sufficiently intimate details of the entire situation. Again, the superintendent or foreman who honestly believes he has made the proper decision refuses to be swayed by staff argument.

Ten Years Experience in Human Audits

Since 1920, the American Rolling Mill Co. has made an annual audit of its entire organization, from laborer to works manager. Although it is rather a simple affair, and even after 10 years possesses many defects, yet the personnel division regards it as a helpful guide, even if not mathematically exact.

The taking of the audit is not at all complicated. The personnel men visit each department once a year and check with every man's immediate superior his qualities, good or bad. To standardize the information sought, a form has been prepared which serves as a guide for questioning. The personnel man, however, is not required to limit his inquiry to the questions suggested by the form.

It is surprising the great number of things the audit uncovers. Suppose we take the hypothetical record of an imaginary John Smith. John's audit might read as follows:

"John Smith. Open-Hearth Department. Floor laborer. Age 34. Has been in department two years; in plant three years. Good worker who needs little urging; congenial; proper safety attitude; average intelligence. Might be promoted to nozzle setting first

vacancy. Lays off frequently account home conditions—wife sickly. Also in financial difficulties for that reason." These are all details which it is not unreasonable for the foreman to possess.

This audit not only uncovers a man who is adjudged ready for a better job, but to the trained personnel man it means that here is an opportunity for the mutual interest department to do something constructive for John's troublesome home conditions. The company visiting nurse can be sent around or perhaps John can be talked into the notion of securing special medical attention for the ailing wife.

Imagine now that a year has rolled around. We will have to assume that Mrs. Smith has been cured, and John has the nozzle job under a new foreman. If the next audit should read:

"John Smith. Open-Hearth Department. Age 35. Has been in department three years; in plant four years. Lazy; disinterested; disregards safe practices; can't recommend for a better job," then the personnel man must check up, and find out why. He can go to John's present foreman and say:

"Look here, Bill. John Smith worked for Henry Jones last year, and he says thus and thus. Now your opinion is just the opposite. What's the matter? Let's talk it over."

It is possible some change has come over John; a good man sometimes "goes to pieces" for many and varied reasons. It is also possible that John has failed to "make a hit" with his new foreman, who is giving a biased opinion. Such action is only human. At any rate, it is up to the plant personnel man to find out "why." If he is a good one, you may be sure he does, even if he has to go to the superintendent, or to John.

Opinions of Foremen Commonly Uniform

Cases similar to the one described are surprisingly few. The uniformity of opinion among mill foremen is almost uncanny. Here at Armco we have checked the audit of men who have passed on to the supervision of other foremen, and generally the appraisals agree. As an example, there is the audit of a man whose superior suddenly left our company, having no opportunity to communicate with his successor. You can see how closely the opinions of the two executives agree:

"William Johns. Age 30. Engineering department designer. In department, five years; in plant six years. Brilliant but temperamental. Doing very responsible work, but inclined to be erratic at times. Easily discouraged, but on the whole consider him a good man. Do not believe he could handle supervisory work. W.D.V. 8-18-29."

"William Johns. Age 31. Engineering department. In department six years in plant seven years. Puts more energy into work he likes best; rather moody, does not take it well when one of his suggestions is disapproved; smart man, whose work is above the average, but needs diplomatic handling. Might fit into sales work, or as a special assistant where he doesn't have to handle men. C.G.G. 8-1-30.

Though their expressions differ, both men obviously concurred in their appraisal.

An occasional case turns up something like this:

Suppose a man has worked for the same foreman for five years. Four audits show the same result—the foreman appraises the man an excellent worker. But the fifth audit reverses this opinion; the foreman suddenly decides the man is "a bad egg." What is wrong? Sometimes, merely calling the foreman's attention to the inconsistency will cause him to revise his audit. Sometimes it is the result of embroiled relationships between foreman and man. Whatever it is, the personnel department must discover the cause. Perhaps the answer is poor foremanship; perhaps it is "poor man."

Usually, the foreman's evaluation of his men is checked with the department superintendent. When the supervisory group is audited, we secure a double check from the department head and his assistant. At all interviews between personnel men and foremen, the personal records of every man in the section are kept at hand for ready reference.

Audit Book for Each Department

After the audit is completed, the pages are sorted and made up into books, one for each department. The outstanding men in each department are listed on the front page, so the person who refers to it can see at a glance the men who outrank their fellows. All persons having special ability along certain lines, the mis-

(*Concluded on page* 630)

PERSONNEL MAN'S GUIDE FOR QUESTIONING FOREMEN IN TAKING PERSONNEL AUDIT

GENERAL RATING

Exceptional—Above Average—Average—Below Average.

AS WORKER ON PRESENT JOB

Good Man—Hard Worker—Plugger Type—Slow—Speedy.

DEPENDABILITY

Steady—Irregular—Lays Off Without Notice—Late to Work—Requires Supervision—Carries Out Instructions.

AMBITION

Tries Hard—Looking Forward to and Learning the Next Job—Taking ARMCO Training.

INITIATIVE

Goes Ahead by Himself—Clock Watcher—Needs a Leader—Can Lead Men—Lazy.

DISPOSITION

Cheerful—Noisy—Sulky—Alert—Gets Along Well with the Men—Cooperates.

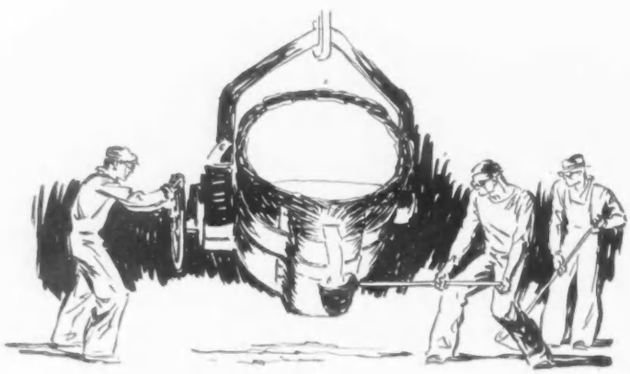
PROMOTION

Can Handle Next Job—Will Make a Leader—Foremanship Timber—Reached His Limit—Needs Experience—Needs Training.

TRANSFERS

Would Fit in Better Some Place Else—Has Asked for Other Work—Deserves Something Better—Unsatisfactory.

POINT SYSTEM FOR DETERMINING



THE point system for determining molding piece rates has been used with only slight alterations since 1922 in the plant of the Federal Malleable Co., Milwaukee, having proved satisfactory for rating squeezer and bench molding jobs, stated W. J. MacNeill, superintendent of the Federal company, in a paper presented before the American Foundrymen's Association.

Application of the system consists in assigning values to each part of the mold-making operations, the values being expressed in points. The sum of the points represents the total value of the various operations required in making a mold but does not express it as a price per mold. To convert the total points into a price per 100 molds, the total must be multiplied by an hourly earning coefficient. To the resulting figure is added the pouring, which is paid for at the rate of 10c. per cwt. of casting weight per 100 molds.

In Table I is given the basis for the point system in point values and hourly earning coefficients. Application of the system to specific jobs is illustrated in Table II. For convenience in converting total points into dollars per 100 molds, points should be considered as cents, so that the multiplication by the coefficient gives a direct answer in dollars and cents and no confusion results in pointing off the proper number of decimal places.

The point system can be applied to practically any squeezer job and to about 80 per cent of bench jobs. It is not reliable, however, for complicated bench work or for any floor or large machine jobs on direct application. Nevertheless, it can be applied indirectly in the following manner:

Take a job on which a satisfactory molding price has been established and determine the total points. Divide the price by the total points to get the value of the point in cents. Determine the total points for the new floor or bench job in the usual manner and multiply the total points by the value per point to ascertain the new molding price.

"For example," said Mr. MacNeill, "suppose we are required to set a price on a floor job weighing 20 lb., having no core, in a 20 x 40 x 8-in. flask. The ordinary application of the point system gives $23 per 100 molds as the piece rate. Knowing that this rate is entirely too high, we check into other floor jobs which we have made before and find a somewhat similar satisfactory job at a piece rate of $17.25 per 100 molds. We find that the total for

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TABLE I.—POINT VALUES AND HOURLY EARNING COEFFICIENTS

Operation	Points
Sand handling	30 for each 100 cu. in. of flask content 50 for each 100 cu. in. of flask content above 2000
Chills	1 for each chill which can be dropped in place 2 for each chill which must be set carefully
Bands	2 for each band placed in mold
Core setting	1 for each small core dropped into place 2 for each small core set into place 3 for each medium core set into place 4 for each large core set into place 6 for each small complex core set into place 8 for each large complex core set into place
Handling equipment	12 for each plate pattern of 1 gate for squeezer 2 for each additional gate 14 for each frame pattern of 1 gate for squeezer 2 for each additional duplicate gate 17 for each hand pattern for squeezer 4 for each additional duplicate of gate 6 for each additional different gate 17 for each plate pattern hand rammed 20 for each hand pattern hand rammed 4 for each additional duplicate gate 6 for each additional different gate

Hourly earning desired	50c.	55c.	60c.	70c.	75c.	80c.	90c.	$1.00	$1.10
Coefficient	5	5½	6	7	7½	8	9	10	11

Pouring: 10c per cwt. of casting weight per 100 molds.

MOLDING RATE AND COSTS

SINCE the majority of foundries have no time-study facilities, the point system offers them a simple, reliable method of establishing equitable molding piece rates. It can also be used by the sales department for estimating costs and quoting on a job. In this article W. J. MacNeill, superintendent of the Federal Malleable Co., Milwaukee, describes how his company has successfully applied this system since 1922.

this job is 400 points, or a value per point of 0.0431c. The points for the new job amount to 300, so that the total price is 300 multiplied by 0.0431, or $12.93 per 100 molds."

Mr. MacNeill stated that his company has found that the value per point varies widely between floor and bench jobs, but selection of the standards of point value from jobs which have been well established makes it possible to rate practically any job under the point system.

In addition to setting up a standard for molding rates in the foundry, the point system can be used to advantage by the sales department for estimating purposes. A salesman who understands the rudiments of molding can estimate the flask size and rate the cores in a job closely enough to permit him to estimate the molding cost of a job which will be close to the price actually paid. Thus he can quote a price to the customer in many cases where, without the aid of the point system, he would be obliged to go back to the plant and confer with the foundry foreman before being able to give a price on the job.

Some standards of the point system have been criticized by people who have checked them against time studies. The principal complaint, declared Mr. MacNeill, is against the allowances for setting or dropping a large number of small cores. It seems that when more than eight similar cores are set or dropped in one mold, the allowances of two and one points, respectively, are too high, and allowances of 1½ and ½ points are ample. The rest of the system checks closely with time-study rates. Since the majority of foundries have no time-study facilities, the point system offers them a simple, reliable method of establishing equitable molding piece rates.

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TABLE II.—APPLICATION OF POINT SYSTEM IN FOUNDRY

Casting weight, ½ lb.; pieces per mold, 10; cores, none; flask size, 10 × 16 × 7 in. Equipment, plate. Made on squeezer.

Sand (10 × 16 × 7) = 1120 cu. in. at 30 points per M cu. in. (33.6)	0.34
Cores and chills—none	
Pattern equipment—plate on squeezer	0.12
Total points	0.46
Hourly rate desired, 70c	×7
	$3.22
Casting weight per mold, 5.0 lb.—per 100 molds, 500 lb., at 10c. per cwt.	0.50
Total piece rate per 100 molds	$3.72

Steel Houses Seen as Salvation of Steel Trade

MASS-PRODUCED steel houses, turned out by factories in the same way as automobiles, were proposed by Harold Wright, British economist, at an Industrial Alliance conference, recently held at Oxford, England. He declared this system would solve the housing problem and provide employment for the unemployed in the iron and steel industries.

"The factory-built house is sure to come," said Mr. Wright. "It is only waiting for the man who will do for houses what Henry Ford has done for cars. The iron and steel industries are asking for Government assistance. Unemployment in the shipbuilding industry is intense. Already steel walls, partitions, ceilings, floors, doors, arches and windows are being made in Sheffield. The opportunity is not to be lost."

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As illustrative of the effects of proper firing of galvanizing pots, W. H. Spowers, Jr., consulting engineer, New York, submitted an experience at the recent meeting of the Wire Association. A kettle in a Canadian installation was started Jan. 8 and was first drossed on April 18, delivering 1020 lb. of dross. It was drossed the second time on May 23, delivering 860 lb. of dross. In five months 175,822 lb. of spelter were consumed and the dross removed amounted to 1880 lb., a loss of slightly over 1 per cent for the five months' operation. A companion installation of the shallow underfired type gave a yield of dross of 21 per cent in the same five months.

HEAT TREATING PARTS IN AUTOMOBILE FAN MANUFACTURE

By H. M. HEYN
Surface Combustion Co., Toledo, Ohio

MANY automotive manufacturers prefer to have the engine cooling fan made in an outside plant, especially designed and equipped to turn it out in mass production. One such type, standard equipment on many makes of cars, is made by the Automotive Fan & Bearing Co., Jackson, Mich. While several kinds of fans are produced here, the principal one is plain bearing with a lubricating pump in the fan hub. This fan is patented.

This company has a modern plant which is more than 200 ft. square. The building is constructed of brick, concrete, steel and glass. A strip along the west side contains the executive offices, engineering department, drafting room, etc. A strip on the east side is used for incoming material and as a shipping room, being paralleled by a spur track from the Michigan Central Railroad. Shipments made by truck are taken through a truck room with a depressed floor level, in the northeast corner. The boiler and heat-treating rooms are separate and are at the south end of the building.

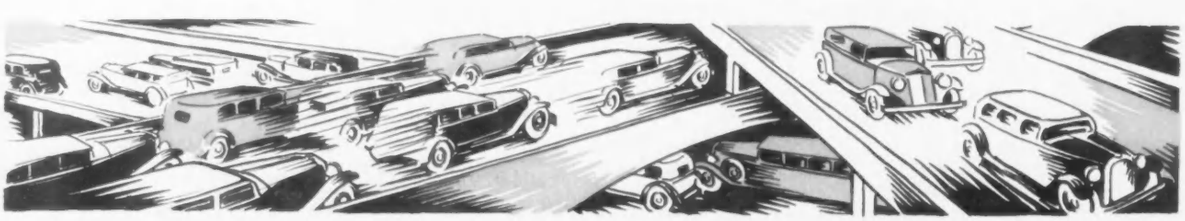
Lines of tools making the fan parts are arranged parallel to each other in the south end; the tool and die room occupying the central portion and the press room the north section of the building.

Automatic screw machines turn the fan shafts from cold-drawn steel bars. After these have been carburized, the ends are trimmed in more automatic screw machines, hopper fed. Heat treated further, these shafts are finish ground in centerless grinders, the pilot end is finish turned, and they are then sent to the shaft assembly, where the fan shaft gear is riveted on.

Starting in the small press department with cold-rolled strip steel 1½ in. wide and ⅛ in. thick, the fan shaft gear is blanked and pierced in a punch press. It is then transferred to the hobbing department, where it is put into an arbor for turning the outside diameter. The teeth are cut on gear-hobbing machines. A belt sander is used to take off burrs and the center hole is chamfered in a chamfering machine. This gear is then riveted on to the shaft and the assembly is washed.

The idler gear shaft, ¼ in. in diameter, is made from bar stock complete and finished in automatic screw machines. A laminated bakelite disk is riveted on to it and teeth are cut in this disk in a hobber.

Gray iron castings forming the hubs are first chucked in a special machine, where the outside diameter, pilot and front and back faces are turned with three tools and a center hole is drilled with a fourth, all in one chucking. The center hole is broached, the hub is washed and then put on to an expanding stub arbor of a lathe, where the back



LIGHT manufacturing, such as that of automobile radiator fans, is susceptible of the same straight-line movement of materials as has become famous in building automobiles themselves. How one company makes these fans and heat treats the parts in process is told here. Automatic machines are used wherever possible, as in making the shafts and some other parts. Strip steel is used for the gears and iron castings for the hubs. Spiders are blanked and pierced from strip steel in one operation.

face and pilot are finish turned with two tools. Put into a revolving fixture on a multiple-spindle drill press, ten holes are drilled in the face of the casting. Then four radial holes are drilled in the end of the barrel, in a second drill press, where also a ¼-in. hole is reamed for the idler gear shaft.

Next the gear counter bores are machined complete in two double-spindle cam-fed drill presses. The internal oil relief groove is machined in the end of the barrel and the end of the casting trimmed to length in a hand screw machine. A spiral, oil-return groove is then put in to the end of the hub with a Fisher oil grooving machine.

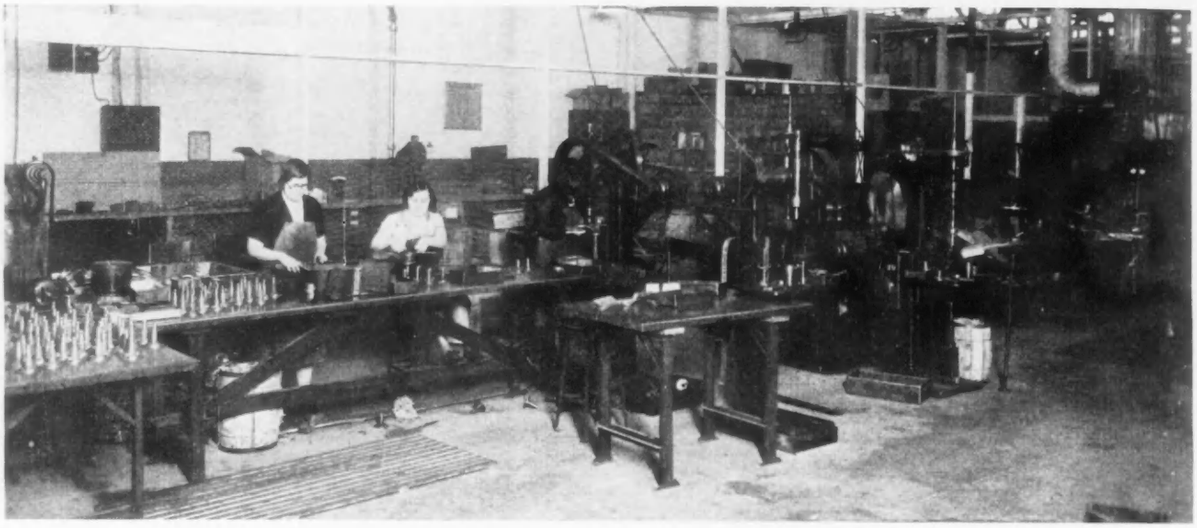
The fan housing is stamped from 16-gage cold-rolled sheet steel. The flange is faced and the shaft hole bored in a hand screw machine with a specially designed chuck. The oil filler, a screw machine product, is now soldered on and the pressed steel pulleys are pressed on and spot welded in place. The fan blades and fan spiders are made in the stamping room and transferred to the blade assembly. Here they are carefully weighed and sorted out according to weights within a fraction of an ounce, so as to assure perfect balance, and are then riveted on to the spiders, in punch presses.

Spiders are blanked and pierced in one operation from 10-gage hot-rolled strip steel, and the spider arms are twisted to a predetermined angle in a specially designed pneumatic press. Some of the blade assemblies are statically balanced before being riveted on, the blades being held in place temporarily with clips.

This spider twister, said to be the only one of its kind, was specially designed for this company. It consists of two rams, one above the other, held in a cast iron vertical frame. On the head of the lower ram is a set of four dies located in a trunnion frame with a cylindrical seat in the center, against which the center of the spider is held. A similar set of dies is mounted on the upper ram and just above the first set. The upper ram descends, holding the fan in place, while the lower rises and twists the four arm dies.

BLANKS of the spider arms, cut in a previous operation, are given their propeller-like shape in this pneumatic press.

All of these parts and sub-assemblies are stocked in the fan stock room, located in the southwest corner of the building next to the executive offices. The main assembly line starts here and runs parallel to the line of offices. Here the shaft and pump gear are first assembled into the hub, together with the idler gear. The oil assembly screw is put into the filler tube in the housing assembly. These two sub-assemblies then meet the blade assembly and all three are put together with screws and lock nuts. The blades are then spun in a fixture with a gage to



Assembly line, in which the parts proceed from left to right.

determine if they are perfectly true. Finally, paint is sprayed on and they are air dried.

This oil pump operates as follows: The idler gear draws oil from the reservoir and this gear and the main gear, running together, form a gear pump which draws oil from the housing and discharges it on to the main shaft bearing under a pressure of 20 lb. The oil is forced along to an annular groove in the hub at the other end, where it is thrown back into the housing through the radial holes.

Counter-Flow Furnace Conserves Heat

IN the heat-treating room, 40 x 40 ft., are two furnaces which were designed and built by the Surface Combustion Co., Toledo, Ohio. One of these, used for carburizing, is built of brick, steel encased and is 14 ft. long and 7 ft. wide. It is of the counter-flow type, being equipped with two tracks so that two rows of boxes can pass through at the same time and in opposite directions. In this way the hot outgoing work gives up considerable heat to the cold incoming work, thereby materially increasing the efficiency of the unit.

Parts to be case hardened are packed on a table in boxes with carburizing material, a tray forming a cover is put on top and the box and cover are turned over. These boxes are then transferred, by an overhead monorail, to the platform of the furnace. There is a 3-ft. platform and a pneumatic pusher on each end of the furnace, so that both ends are charged and unloaded together.

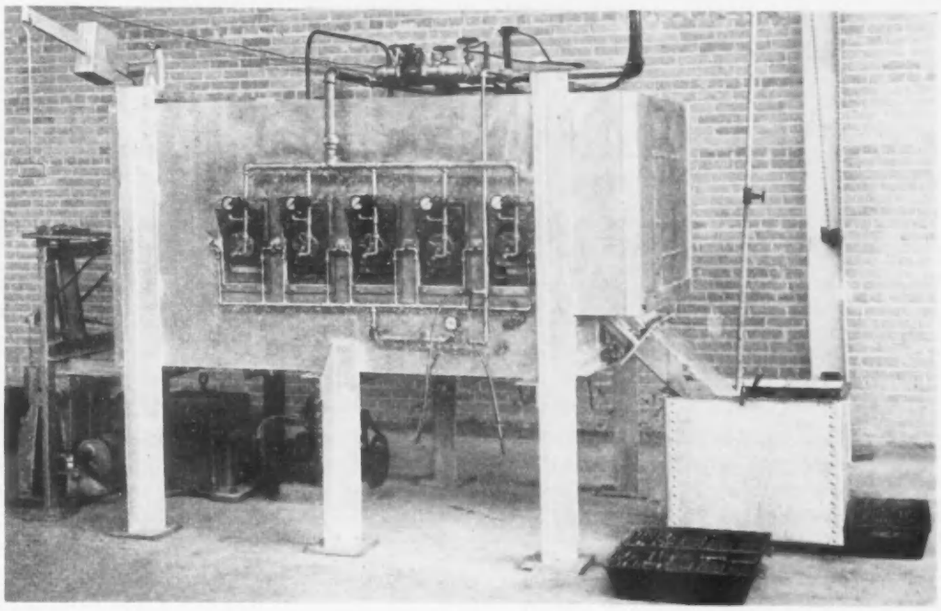
Heat is supplied through 12 gas burners, half on one side and half on the other, half firing below the work and half tangentially to the arch of the furnace. The rails are supported on piers extending down to the furnace foundation, and it is between these piers that the lower tiers of burners fire.

The furnace walls are composed of 4½ in. of firebrick and 9 in. of insulation. A counter-weighted cast iron door is supplied at each end, which is lined with 2½ in. of fire brick and 4½ in. of insulation. The furnace temperature is automatically maintained by two recording controls connected with two thermocouples and a motor-operated valve on the gas supply lines.

Heating 285 lb. of work an hour to 1650 deg. F., this furnace consumes 447 cu. ft. of 530 B.t.u. gas. The maximum burner capacity is 1260 cu. ft. an hour.

Of the V-notch pusher type, the other furnace is used for hardening. It is constructed of heavy steel plate, and lined with 4½ in. of firebrick and 9 in. of insulation, being 10 ft. 7 in. long and 6 ft. 4 in. wide, outside dimensions. Its cast steel alloy hearth has 10 V-notches running from front to rear; the work is pushed along these notches, each piece pushing the one in front of it. The pusher, motor operated, has 10 rockers corresponding to the 10 rows of work. But, instead of pushing together, the 10 rockers push one after the other in a progressive cycle.

A counter-weighted door at the charging end is of cast iron lined with 4½ in. of firebrick. At the discharge end the work drops through a hole in the hearth into a chute and thence into the quench. To



PUSHER to the hardening furnace is at the left and a sealed chute delivers into the quench at the discharge end. The furnace has automatic temperature control.

insure uniform quenching the V-notches are continued along the chute, so that each piece drops in without contacting the others. The chute forms an air seal between furnace and quenching medium so that no cold air can enter and thus cause scaling.

This furnace, also, is heated with 12 gas burners; half on each side, and the temperature is maintained as desired with an automatic controller having a recording pyrometer and a motor-operated valve in the gas supply line.

Burners of Special Type

A special feature of these furnaces, the burners are of the two-stage velocity type, with a turn-down capacity of 10 to 1, which automatically takes care of the temperature, all the way from full load on down to the lightest load. At the same time a constant gas-air ratio is maintained throughout this range of firing, thus eliminating the labor of an operator in adjusting the proper atmosphere within the furnace each time a change in heat input is made. These burners operate with gas at around 10 lb. pressure, and without backfire.

Heating 200 lb. of work an hour to 1500 deg. F., the fuel consumption is reported at 252 cu. ft. of 530 B.t.u. gas.

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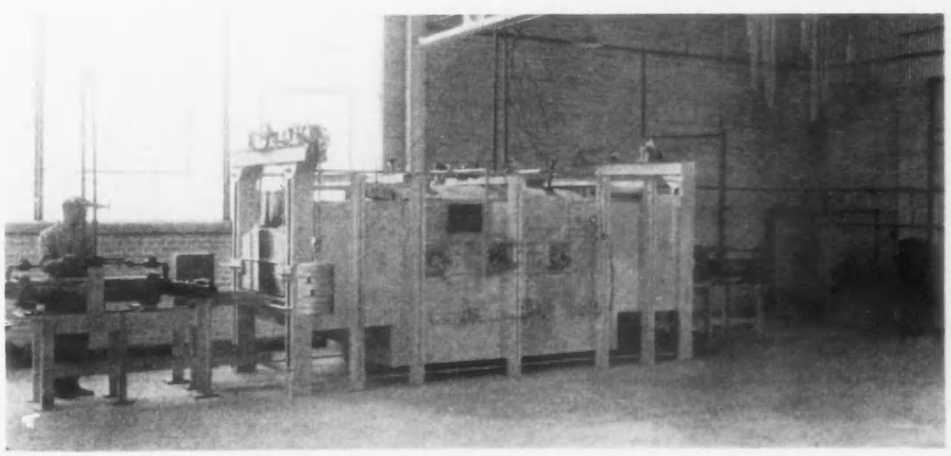
For baking wire rods, R. S. Coulter, combustion engineer, Lebanon, Pa., proposed a system of forced ventilation and recirculating of air in a paper read before a recent meeting of the Wire Association at Cleveland. He claims with the system a fuel cost, using fuel oil at 3c. a gal., of 12c. a ton of rods and a thermal efficiency of 27 per cent.



CARBURIZING furnace of the pusher type, which has automatic temperature control, is operated from both ends, incoming material receiving preliminary heating, in one line, from the outgoing treated material in the other.

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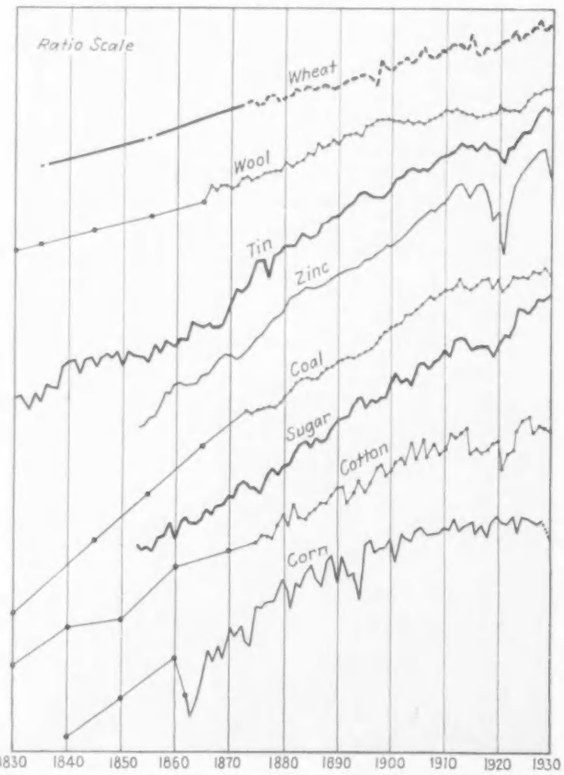
ARE GENERAL PRICE LEVELS

IN analyzing the relationship between credits and price levels, the Royal Bank of Canada, Montreal, has studied rates of growth of a large number of commodities. These are shown in diagrammatic form, on ratio scales, so that the relative growths appear clearly. Our illustrations, taken from a recent letter of that bank, show how greatly the growth in use of metals has exceeded the growth experienced in other commodities. What follows in succeeding paragraphs is taken from the letter mentioned. The bank credits its underlying data to the work of Carl Snyder, statistician of the Federal Reserve Bank of New York.

Non-Agricultural Production of World Notably Stable

AT a time when the world is discussing the possibility that production and productive capacity have outstripped potential demand, and when it is suggested that this is particularly true of raw materials, it may be worth while to examine the trend of world production to determine the extent to which recent expansion has been abnormal. Two of the charts show annual production of wheat, wool, sugar, cotton and corn—agricultural products; and of iron, copper, tin and zinc—mineral products, upon which industrial activity is dependent. The data cover periods varying from 75 to 100 years.



Course of production, over nearly a century, of eight world commodities.

Annual expansion in each of these types of production has been much more regular than we have been accustomed to believe. The curves have been drawn on a ratio scale, which means that if production had increased by the same percentage for a number of years the result would be portrayed by a straight line. It is the inclination of each line, not its position on the chart, that is important. This scale permits direct visual comparisons between the rates of increase for the various commodities.

Expansion has been much more regular, much more harmonious, decidedly more consistent than has been generally realized. Increases have not occurred by fits and starts. In spite of weather which has brought occasional widespread crop failures, the rate of increase in various forms of agricultural production has been reasonably steady. Wheat and wool have shown a rate of increase approximately the same as that of population.

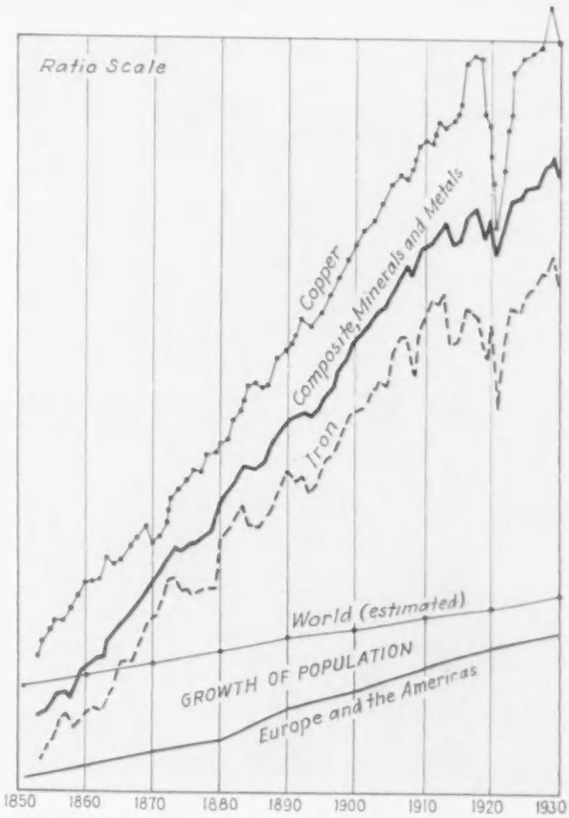
Note both the regularity and the low rate of expansion in wheat production, as compared with that for metals. The degree of variability in year-to-year production has been much greater for agricultural products than for minerals. The lines for copper, tin and zinc approximate a steady increase of 8 per cent a year over a long period.

Influence of Business Cycles Not Pronounced

Where are the business cycles which have stimulated rapid increases of production for a few years, and where the depressions which have cut down production by 15 or 20 per cent? These curves give little encouragement to the theory of the business cycle. There is little or no relationship between the breaks in one curve and those in the others. The business cycle within each country has increased and decreased profits; to some extent there have been corresponding increases and decreases in individual lines of activity within a country. But over each industry as a whole, considered on a world scale, production of each commodity has

PREDICTABLE?

A RELATION between credit volumes and volumes of production and trade which is closely parallel to world prices has been discovered by statistical research. It is argued that this may make it possible to exercise greater control over the vagaries of the business cycle, particularly with regard to widely fluctuating prices. One interesting feature of the study is that world production of non-agricultural commodities has shown only minor fluctuations over many decades, except when interrupted by such a cataclysm as the World War.



Relative growth in use of metals, particularly iron and copper, compared with growth of population during past 80 years.

increased steadily, and substantial recessions in volume of production have not taken place.

Total World Production Studied

A CURVE, in the third chart, on page 631, shows the volume of total production for the world as a whole. A ruler placed on the points indicating volume of production for 1881 and for 1911 will reveal how closely world production came to maintaining the same rate throughout the period. (A light dash line shows this.)

This line gives one of the best indications as to the extent of the set-back to world production which resulted from the World War. Both before and after the war the annual rate of increase has been about 3 per cent. The rate of increase in the United States has been 4 per cent. The period of the war and 1921 and 1930 are the only major breaks in the relative smoothness of this curve of world production, except those attributable to agriculture. No year showed an actual recession in total world production of more than 4 per cent.

Minor irregularities in total world output are but a reflection of changes in the volume of world crops. Annual agricultural production is shown in the second line on the third chart. If these irregularities (which are due to weather and crop failure) are eliminated from world production, there is a long period during which this line is almost mathematically straight. Note, for example, the line for "other raw materials." Human welfare is more dependent upon vagaries of the weather than is realized by the city dweller.

Credit and Prices; Their Relation to Volume

WITH accurate statistics available concerning volume of production, it becomes possible to open the timely question as to the relation between volume of production and trade and volume of credit and the price level. For this inquiry, Mr. Snyder made use of production, credit and price statistics of the United States, because data available for that country were relatively complete. The fourth chart, on page 631, gives the results of this study.

In the chart the dotted "straight" line represents a smoothing out of the production data. The heavy black line is a picture of the volume of the loans and investments of all the banks; this line is called an index of credit. It will be noted that, when the line representing credit has risen at a rate more rapid than that of the line representing production, there has been also a rise in the lower dotted line, representing the general price level in the United States.

From 1897 to 1907 the volume of credit increased more rapidly than production, and prices rose. From 1893 to 1896 and from 1929 to 1931 there was no expansion of credit. Volume of credit was not keeping abreast of production, and in both these instances

(*Concluded on page 631*)

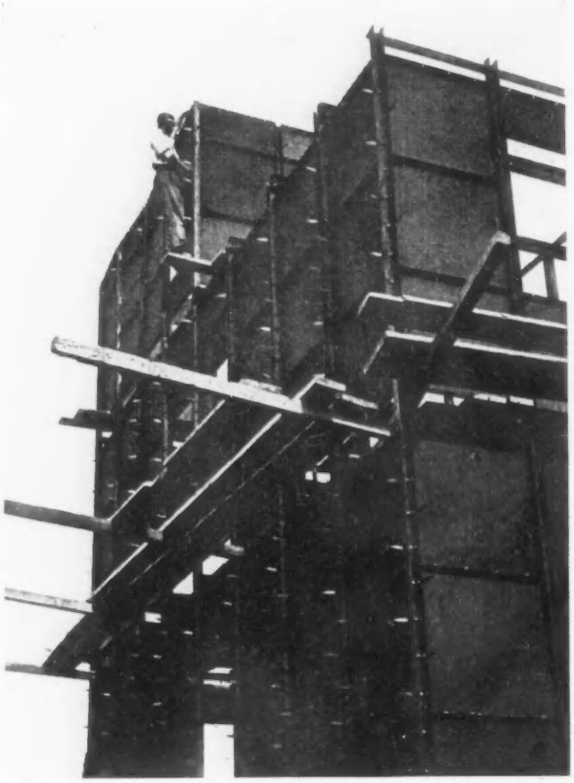


FIG. 29.—Building a house on the Böhler system in Germany, using small steel plates inside and stucco on Heraklith for the exterior.

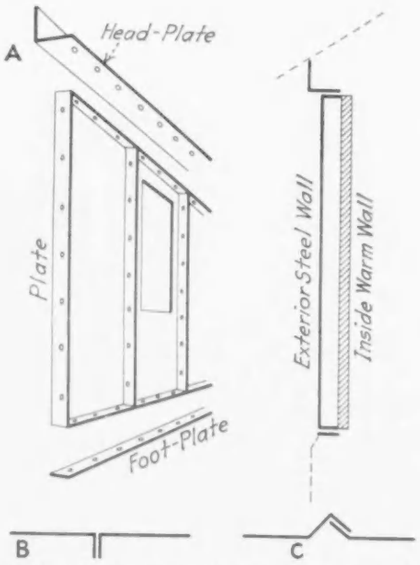


FIG. 30.—Steel copper-bearing sheets, flanged on all four edges, are bolted together to form walls, in the Blecken system, in Germany. How these are joined to each other and to the frame is shown by the sketches.

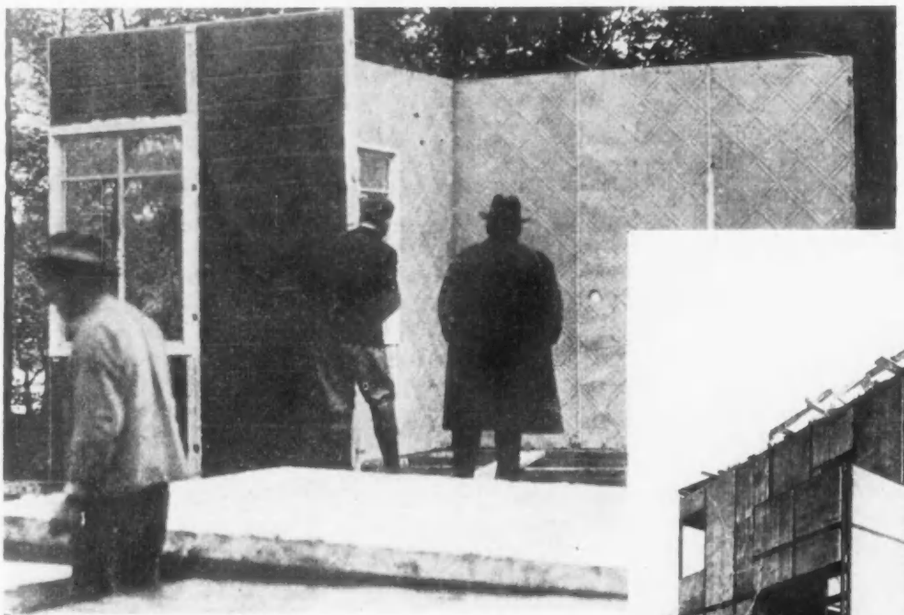


FIG. 31.—One-story house under construction, using wooden frame, copper sheathing on the outside and steel on the inside, with insulating material between.

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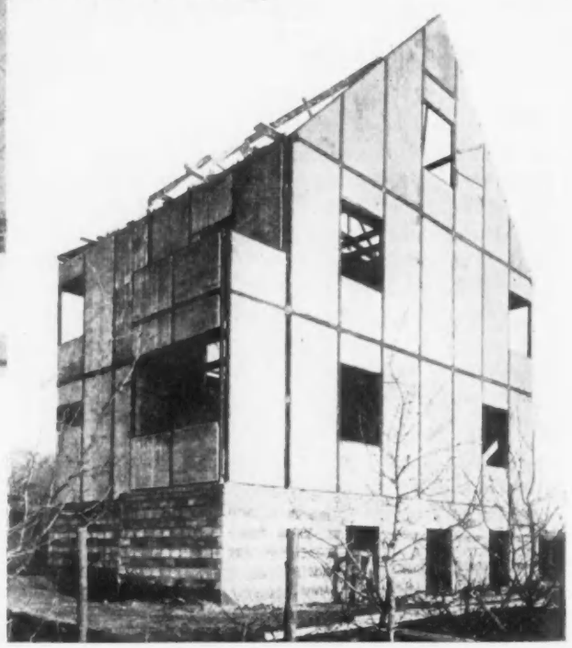
FIG. 32.—German house with steel frame, and walls of precast blocks of concrete, in unit sections. This is the method of Proeschold Brothers, Rudolstadt.



STEEL HOUSES OF GERMANY AND FRANCE MOSTLY SMALL

By THOMAS J. FOSTER
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Long Island City, N. Y.

GERMANY and France, in attacking the steel-house problem, have been hampered by building regulations. In some cases they could not go above one story in height. They have made large use of copper-bearing steel sheets or light plates for exterior walls, and have developed some ingenious methods of construction. This is the fifth installment of an article dealing with the use of steel in building private homes. In the concluding section the functions of major parts of such a structure will be outlined, in an effort to determine how they may best be carried out.

IN 1928 four German steel companies formed an organization known as the Steel House Building Co. (Stahlhause-Baugesellschaft), with headquarters at Düsseldorf-Meiderich, for the production of fabricated steel houses. Coppered steel sheets form the exterior, their edges turned in at right angles and bolted together. Wood borders affixed to these walls support the fireproof insulating sheets, an air space being left between the interior and exterior walls. The sides of the beams are equal in size to the turned edges of the exterior sheets and the bolts that fasten the outer wall serve for riveting the beams.

Heinrich Blecken, architect, Duisburg, in his pamphlet "The German Steel House," says:

> Steel sheets on steel frames are used mostly in one-story buildings. The sheets are used either alone or in connection with an insulated steel frame. In Germany there are at present three types of this construction. The first one is a combination of steel frame and steel sheets with the insulating wall material behind it. The second is the Böhler system.

This is shown in Fig. 29. It uses small steel plates on the inside and Heraklith with stucco on the outside. Blecken goes on to describe his own construction as follows:

> Steel sheets ¼ in. thick, containing a large percentage of copper, are used for the exterior. These sheets have turned-in borders, making a form. The sheets are bolted together on these turned edges, as shown in Fig. 30. "Stringers" at the top and bottom hold the sheets together.

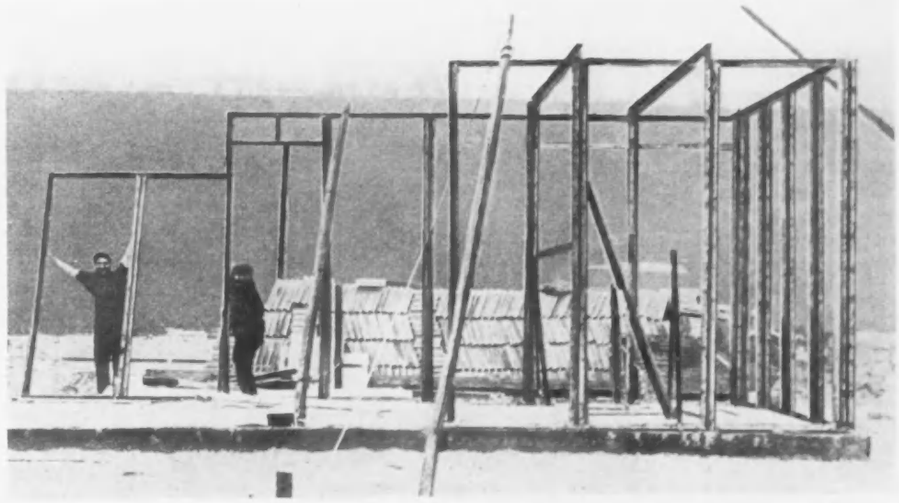


FIG. 33. — Rectangular steel frames erected in units in France, and filled in with cellular concrete blocks.

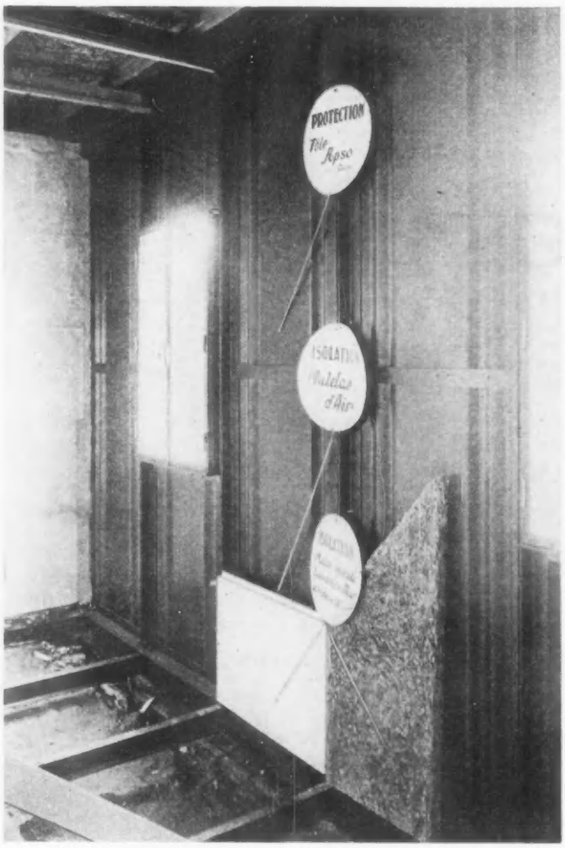


FIG. 34.—Interior of the Strasbourg house in France, arranged for demonstration. Shop assembly of sections makes this an easy and quick job to erect. Air space between outer walls and inner provides insulation.

The sizes for these sheets were determined after extensive research. The problem was to make them fit the normal door and window sizes, and also make a strong construction.

These steel sheets connected as described form a rigid frame able to stand extreme weather conditions. There is a separate insulating wall behind the sheets, which can be made out of various combinations of insulating materials with or without plaster. At present Tekton is used and plastered on the inside.

About 700 single-story houses have been constructed by this system.

The German Steel House Co. (Deutsche Stahlhausbau-Gesellschaft), Gleiwitz, Upper Silesia, is the selling organization and sudsidiary of the United Upper Silesian Iron Works Co. (Vereinigte Oberschlesische Hüttenwerke Aktiengesellschaft). This company has designed several houses for workmen's homes. The walls are thin slabs consisting of an outer shell and an inner wall of thin blocks of cement or gypsum, held in place by a framework of cold-rolled iron shapes. An air space is left between the inner and outer walls. The steel plates are wedged together by grooves in the framework provided by strips of chemically-treated wooden molding. The inner wall also fastens into grooves at each end of the panel, and the blocks are joined with plaster or cement to form a solid panel. Cement blocks support the floors and walls between iron joists. Rafters and sheathing for the roof are of wood. Three-inch cement blocks form the partitions.

Herr Müller, of the firm of Ph. Holzmann, uses two types of construction. One has steel framework, assembled at the building site with walls of precast gypsum slabs, faced on both sides with metal lath and stuccoed outside and plastered inside. The other is reinforced concrete with standard forms poured in the field. Both types have walls made of three layers of material with two air spaces for insulation.

Hirsch, Kupfer and Messingwerke Finow, Hamburg, have a one-story house with wall sections of wooden skeleton frames covered on both sides with metal sheating, with insulating material between. The outer walls are copper and the inner walls and ceiling are steel. Fig. 31 shows a house in course of erection.

Martin Koerber, of Greiz, has designed and built a circular house containing six rooms, attic and base-

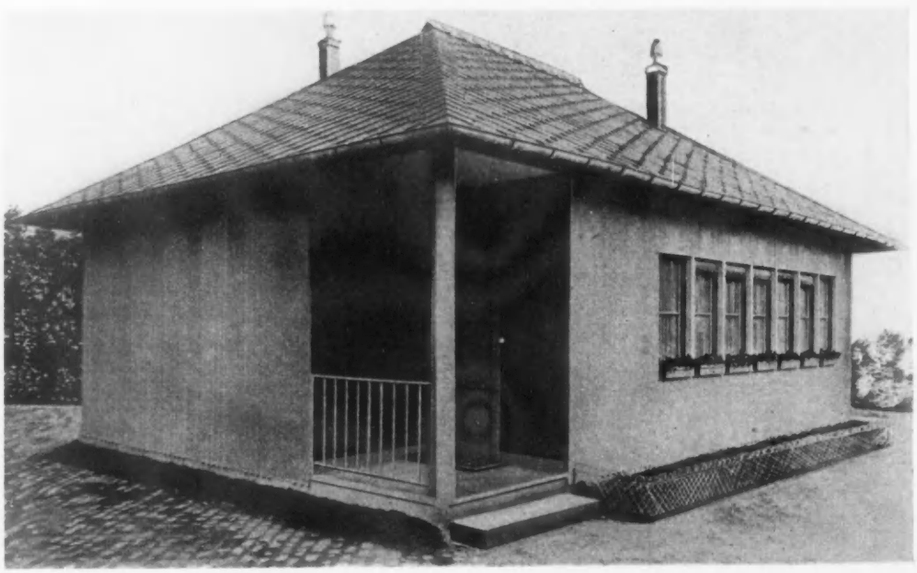


FIG. 35.—Exterior of the house whose interior is shown in Fig. 34. The vertical corrugations on the copper-bearing steel sheets will be noted.

ment, which he claims can be factory produced and shipped to the building site and screwed together on a small brick foundation. The inventor claims that a circular house requires fewer parts than the standard dwelling.

It will be seen from these descriptions that nearly all of these various constructions use sheet steel exteriors, which can be made only one story in height, according to the building law in Germany. Houses of more than one story have a steel frame with precast blocks of concrete, cement, etc., as shown in Fig. 32. The German steel industry is said to be working on the design of new light sections especially suitable for small house construction.

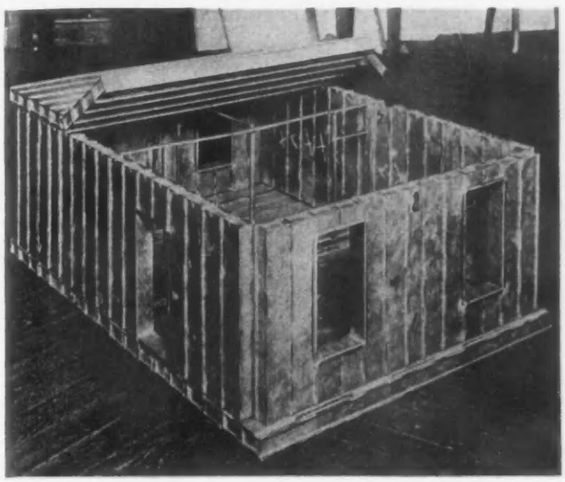


FIG. 36.—Model showing method of construction of the Multicellulaires house (France). Steel box sections form the walls, which in turn support the upper structure.

The following information regarding steel house construction in France is taken from an article by Vincent Delport in *Steel* for Jan. 15, 1931.

Very few steel dwelling-houses have been erected in France, but several types of houses have been designed. The construction of the Forges et Ateliers de Commentry-Oissel, Paris, consists of standard rectangular steel frames made of two angles back to back, as shown in Fig. 33. The frames are filled in with cellular concrete blocks finished with mortar to give the appearance of a solid block.

The "Isotherme" house, invented by R. Decourt, has a frame consisting of a series of steel angles covered with expanded metal lath. Cork, fiberboard, etc., may be used for the interior walls. The erection method for this construction is so expensive as to make it unsuitable for dwellings.

The design of the Société des Forges de Strasbourg, Paris, has a frame of light angles, bolted together and assembled on a steel channel laid on concrete blocks. A channel beam divides the house in half and floor joists are fastened between the wall and the center channel. Partitions, roof frames, and other parts are assembled in the fabricating shop. Vertically corrugated steel sheets containing copper (known as "Apso") are used for the outer walls. Fig. 34 shows the interior construction, and the finished house is shown in Fig. 35. This construction is easily and quickly assembled and erected.

In the design of the Société de Constructions Multicellulaires, Paris, shown in Fig. 36, the walls are made up of a series of steel box sections of corrugated sheets, the walls supporting the upper part of the structure. Flat sheets, their height calculated to allow for doors, windows, etc., close in the house. Fabrication is done in the shop. The inside walls are sawdust and a special binder, the outside a complex mixture of cellulose, asbestos and silica held together by a binding compound.

The construction originated by Société de Constructions Metallique Fillod (Comefi), Paris, uses a standard steel plate about 20 in. wide by the height of one story, the longitudinal edges of the sheets being bent back to form an angle with the inner face of the sheet. The wall is formed by these assembled sheets in two parallel surfaces held together by vertical tubes 12 in. long and strengthened by horizontal tie-pieces.

FIG. 37. — Inner and outer walls are of steel sheets, put together as shown by detail at left of the house. The roof of this French structure is of sheet steel.

Walls and partitions are assembled to the concrete foundations by means of steel strips or angles. The space between the wall sheets may be filled with some insulating material such as sawdust. The roof is sheet steel. The members are assembled in the shop and erected on the building site very quickly, no rivets or bolts being required. The finished house is shown in Fig. 37, the system of construction being indicated at the left.

(To be concluded)

WHY COLD-WORKING CHANGES

By E. V. CRANE
Staff engineer, E. W. Bliss Co., Brooklyn

CHANGING physical properties, the outward evidences of cold-working and recrystallization, have been dealt with in the author's earlier discussion in the columns of the plastic cycle. Next in order is a résumé of the effects of the cycle upon the structure of the metal itself, to show more clearly why the physical properties change as they do.

A sample of any plastic metal in its cold-working range will be built up of a tremendous number of individual crystals of all shapes, in random arrangement. The average size of these crystals or grains may be large or small, according to the time and temperature of the last previous anneal. The internal structure of each individual crystal, in the annealed state, will be an orderly array of atoms, uniformly spaced according to the lattice pattern of the particular metal. Cold-working of the metal will cause distortion or change of shape, accomplished by many slight movements in each crystal. The movements take place along the slip planes or planes of weakness between layers of atoms.

Fig. 15 shows a photomicrograph at 200 magnification of a 70:30 brass which had been cold-worked to "extra hard" temper. The outlines of the old crystals can be distinguished in many places and in each crystal are evidences of slip plane movement along many parallel lines. This is a section of the wall of the fourth draw in the production of a small-arms cartridge case. The metal had been annealed after the previous operation to "soft temper."

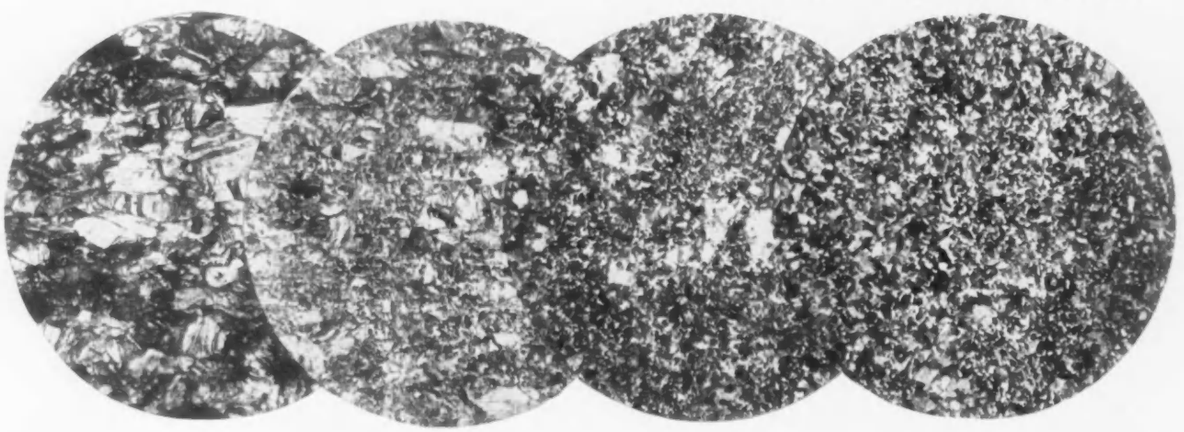
This would bring crystals to the size shown by the old grain outlines, but their structure would be uniform and unstrained. The 50 per cent reduction in wall thickness was accomplished by ironing, which differs from both drawing and rolling, though the effect upon the metal is substantially the same. This example is sufficiently similar to that covered by the curves in Fig. 14 (Aug. 20, page 544) so that the two

FIG. 15.—Slip planes in 70:30 brass cold-worked by ironing to about extra-hard temper, (green filter) magnified 200 diameters.

may be used together to illustrate a more detailed review of the plastic cycle from the structural viewpoint.

Reference should be made also to the excellent series of photomicrographs by Bassett and Davis, which are shown in Fig. 16, and which show the

Fig. 16.—The plastic cycle illustrated by photomicrograph (magnified temper (50.9 per cent reduction), as shown at A and Fig. 15, and then band C and then grain growth D to H. "Soft" temper apparently



A B C D

PROPERTIES OF METAL

WHY the physical properties of a metal change as they do in the process of cold-working (as for example in deforming sheets), with or without intermediate annealing, is explained in this, the third of four sections of an article on strain-hardening. How the atoms tend to group themselves into larger and larger crystals, under the influence of heat, is shown clearly. It is explained how the slip movement in any crystal may vary over a wide range, in adjusting the metal to the conditions imposed by cold-working or by the action of high temperature.

changes in grain size and condition, for substantially the same brass, from the strain-hardened state through recrystallization and grain growth to a very large-grained, unstrained structure.

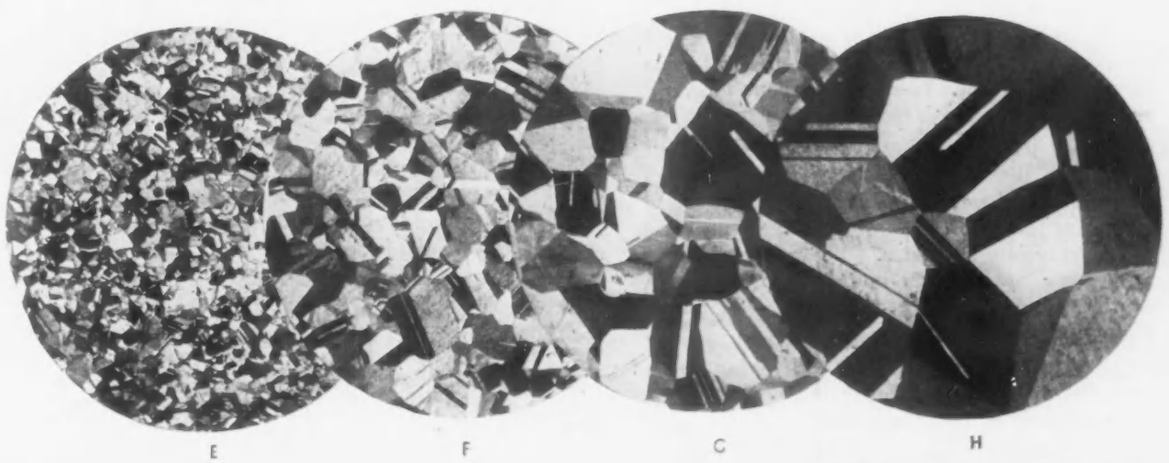
The size of the old grain boundaries in the cold-worked sample, *A*, would indicate that, before rolling, the unstrained structure must have resembled that shown at F. The heat applied ranged from 300 and 350 deg. C. in *B* and *C* to 850 deg. *C*. in *H*. In comparing these photomicrographs with Fig. 14, it should be noted that differences in temperature scales and in time of anneal must be considered.

Starting the plastic cycle as in Figs. 14 and 16 with the severely strained structure which is shown well in Fig. 128, the temperature may rise to about 400 deg. F. before any change is noticeable. The metal is alpha brass, a solid solution, and the zinc atoms (30 or 33 per cent) are occupying positions in the copper space lattice. The uniformity of the original pattern has been badly distorted by the cold-working and spacings between atoms are no longer uniform in all directions. Therefore forces between atoms are not nicely balanced, as they are in the equilibrium condition, and internal strains exist.

The atom of copper has 29 negatively charged electrons moving (in a definite pattern) with relation to its positively charged nucleus. The atom of zinc has 30 similar electrons in a slightly different pattern. It is naturally a little larger and distorts the normal copper lattice to some extent, so that the brasses are less plastic than pure copper.

As more and more heat is applied, the movement of the electrons becomes more violent, and the sphere of the atom and with it the whole volume of the metal increases or expands (slightly). It will be remembered that electrostatic forces of attraction and repulsion maintain such spacings between the constitu-

75 diameters) of 68:32 brass, cold-rolled from "soft" to "extra-hard" subjected to increasing degrees of heat, showing recrystallization in reached at F. (Bassett and Davis, courtesy of American Brass Co.)



E F C H

ent parts of the atom group that the effective diameter of the unit is many thousand times that of the electrons which go to make it up.

When the temperature passes the critical range, as indicated in Fig. 14, and at *B* and *C* in Fig. 16, the activity of the electrons is sufficient to permit the atom to rotate itself into a less strained position with respect to those surrounding it. The result is a disappearance of the old boundary lines and slip lines in Fig. 15.

With longer time at this temperature, or with higher temperature, the atoms tend to group themselves into larger and larger (unstrained) crystals. That is, the arrangement of the 29 electrons of the copper atom appears so to combine their forces as to have definite directional properties. These forces cause copper atoms to arrange themselves in the face-center cubic pattern. Therefore, so long as the temperature gives them sufficient freedom, the individual atoms and smaller groups of atoms may be expected to rotate themselves into alinement with the "polarity" of the larger and stronger groups. That is grain growth.

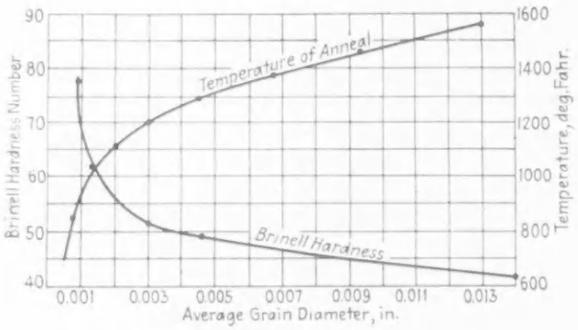


Fig. 17.—Effect of temperature upon grain size, and of grain size upon hardness; 30-min. anneals of 68:32 (yellow) brass cold rolled 50.9 per cent. (after Bassett and Davis)

In Fig. 14, the old grain boundaries disappeared at little over 500 deg. Anneals at higher temperatures produced larger grains, until the 1000-deg. anneal produced an average diameter of 0.040 mm., which corresponds to the "soft temper" rating. Had this annealing been continued at a higher temperature or for a longer time (as was the case at *G* and *H* in Fig. 16) the grain size would have become much larger, while the tensile strength would have decreased even further. Grain growth is arbitrarily checked at soft temper, however, to avoid excessive local weakness due to over-large crystals, and to avoid an undue tendency to wrinkle in drawing the large-grained metal.

It may be noted that forces between atoms are of such magnitude that we cannot normally pull them apart or push them together. Such forces, it has been shown, are far, far in excess of the usual ultimate tensile or compressive strengths. The movement then is a transverse slippage in the individual crystal at an angle to the outside force.

But the metal is made up of many separate crystals of different sizes, and having their lattices or layers in many different directions, depending upon the hit-or-miss growth and working of the crystal. Any continuous movement through the whole piece of metal must then find its way, through the most favorably placed slip planes, from crystal to crystal. After a relatively small movement, interference is encountered with an adjacent crystal which is differently oriented, and further slippage must take place along another plane or in another crystal.

Clearly, the larger are the individual crystals, the less frequent are these interferences and the smoother and easier is the path of any movement. Or the smaller the crystals and more frequent the boundary resistance, the harder we find the metal and the greater is its resistance to cold-working. Thus Fig. 17 illustrates the change of hardness with grain size. A second curve shows the change in grain size with temperature. These data were obtained by subjecting annealed alpha brass (68:32) to 50 per cent of cold-working and then testing specimens after 30-min. anneals at different temperatures. Compare with the grain growth period in Fig. 14.

To whatever point grain growth may have been carried, cold-working will begin to strain-harden the metal at once, as indicated at the right in Fig. 14 and by the Brinell hardness curve in Fig. 3. The individual slip movement in any crystal may vary from something less than the diameter of a single atom to 5000 or more atom diameters. The action of each slip plane movement may be merely to offset one whole section or layer of a crystal with respect to another, or it may cause a twisting or rotation of atoms or groups of atoms along the path of the movement. Its effect, therefore, is destruction of the continuity of the original crystal structure.

In the case of severe working, Fig. 15, it may be described as shattering this structure into fragments, since the first application of heat above the critical temperature releases all strains and causes the old grain boundaries to give place to quantities of new tiny symmetrical grains (not layers of the old grain). The term fragments should not suggest tearing apart, as actual fractures cannot be cured by recrystallization, nor should they appear until cold-working has been carried so far that all available slip planes have been used up.

▲ ▲ ▲

TABLE II

Order of ductility	Order of malleability	Type of crystal lattice	Atomic number
Gold	1	Face-centered cubic	79
Silver	2	Face-centered cubic	47
Platinum	6	Face-centered cubic	78
Iron	9	Body-centered cubic*	26
Nickel	10	Face-centered cubic	28
Copper	3	Face-centered cubic	29
Aluminum	4	Face-centered cubic	13
Zinc	8	Hexagonal close packed	30
Tin	5	Body-centered tetragonal	50
Lead	7	Face-centered cubic	82

*Face-centered cubic, above 900 deg.

The structural plastic cycle is then a case of gradually destroying continuity of the individual crystal structure through slip plane movement, and then re-

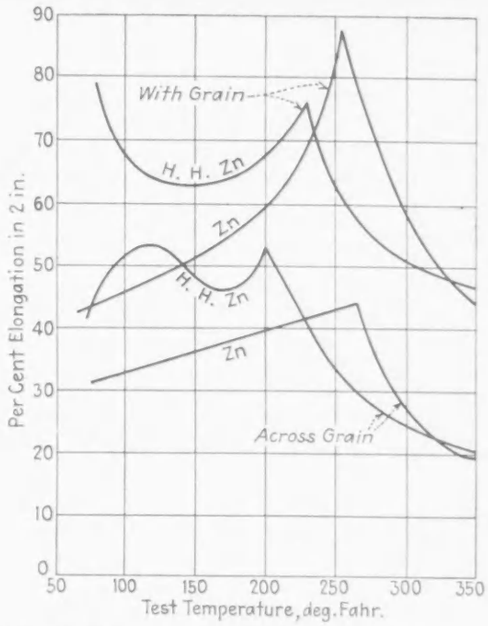


Fig. 18.—The maximum plasticity of rolled zinc lies between 200 and 300 deg. F., as indicated by the tensile test (from Mathewson, Trewin and Finkeldey).

building new unstrained grains through recrystallization and grain growth.

Ductility Differences in Metals

Some metals strain-harden more rapidly than others. That is, they reach a limit of endurance and require recrystallization after they have been worked by a smaller amount than others, whether the work be done in reduction or extension.

Ductility and malleability are qualitative terms ascribed to a capacity to withstand considerable cold-working in tension and in compression respectively. In Table II the order of ductility and of malleability of the several metals are as given by Jeffries and Archer, and Fulton.

The differences in order between ductility and malleability are ascribed to differences in tensile, or what might be termed cohesive, properties of the metals. Most cold press working operations set up combinations of tensile and compressive stresses in the material.

The metals and their alloying elements crystallize in a half dozen or more different space lattices. These are the uniform geometric patterns in which the atoms naturally arrange themselves in the individual crystals of a metal. Of these possible arrangements the "face-centered cubic lattice" is the simplest and the one lending itself most easily to cold-working, as it offers the most planes of weakness or groups of slip planes at different angles to each other. Note the predominance of this pattern among the ductile metals. The body-centered cubic lattice is next. It will be noted that iron takes a place very near the bottom in the malleability table. It may also be noted again that alpha brass, which is quite ductile and malleable, shows the face-center cubic pattern. This pattern changes, however, as the proportion of zinc increases (beyond about 35 per cent) and at the same time much of the ductility disappears.

The lattices of zinc and tin do not lend themselves to "cold" working. But here it should be noted that the lists of Table II are a relative grading at normal *room temperatures*, and that zinc recrystallizes at about room temperature and tin below it. Therefore these metals are really nominally "hot" worked. In fact, as zinc is pretty close to the line, it is often found desirable to apply a little heat to obtain the most satisfactory results. In this connection Fig. 18 is of interest, as it indicates the variation in the ductility of zinc with temperature.

We have previously used change-of-hardness as an index to change of ductility. It may now be used again to indicate the effect upon the ductility of different combinations of two ductile metals which form a continuous series of "solid solution" alloys. Metals which pair up in this way usually crystallize in the same space lattice and are of not greatly different lattice dimensions. Examples are found in copper and nickel, also in silver and gold, the variation in hardness (and therefore ductility) of which was shown in Fig. 19.

Increase in hardness (decrease in ductility) has been explained as due to resistance to slip-plane movement resulting from distortion of the crystal lattice by differences in atom dimensions and forces. Referring to the table, it will be noted that copper and nickel differ in atomic number much less than gold and silver.

From this it might be assumed that the lattice

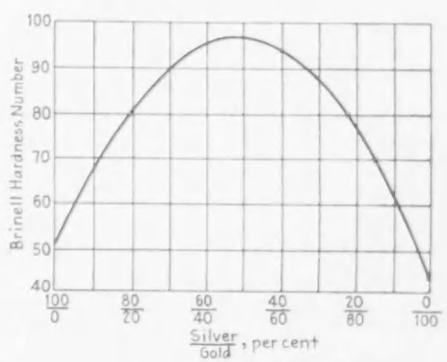


Fig. 19.—Changes in the ductility of "solid-solution" alloys of metals having similar crystal structure; gold and silver in this case. The hardness number gives an inverse index to the ductility (after Jeffries and Archer).

distortion would be less, and the change of hardness less, than that indicated in Fig. 19.

Ductile alpha brass (high brass to yellow brass), when properly homogeneous, shows only the face-centered cubic lattice of copper. The two metals are of adjacent atomic numbers (29 and 30), being therefore of relatively similar atomic volume, and the zinc is believed to occupy positions in the copper space lattice which it does without appreciable distortion or great reduction of ductility. As the proportion of zinc increases above about 36 per cent, however, Beta brass begins to appear. This phase is characterized by the body-centered cubic lattice, differing from that of both pure copper and pure zinc. It is materially

less ductile than the alpha brasses, though better adapted to hot-working.

Low-carbon steels, which are of interest in the drawing group of operations, are a mechanical mixture of pure ferrite (iron), which is quite ductile, and an increasing proportion of pearlite, which is less ductile. The pearlite contains the carbon content of the steel in the form of approximately 13 per cent cementite or iron carbide (Fe_3C), to 87 per cent ferrite. The hard and brittle cementite flakes in the pearlite break up with cold-working and naturally interfere with slip-movement in the pearlite crystals, increasing their resistance beyond that of the pure ferrite crystals.

Variation in hardness and per cent reduction in area between substantially pure ferrite and pure pearlite are approximately straight lines, as the change is not in structure but merely in the proportions of a mixture of two unchanging structures. Fig. 13 shows these properties and indicates thereby the change in ductility of steel with carbon content, through the ferrite-pearlite range. Deep-drawing and extra-deep-drawing steels vary generally between 0.10 per cent carbon steel and nearly pure iron.

(To be concluded)

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How Armco Measures the Worth of Its Men

(*Concluded from page* 613)

fits or the unfits are marked for special attention. If a transfer is desired, the reasons for the request are noted. Curiously, the audit seems to divide the organization automatically into three classes:

First: A small group of able, ambitious and aggressive people.

Second: A large group of average men who are doing their work satisfactorily, but who seem to be satisfied with their jobs.

Third: Another small group of men who for various reasons are not satisfactory to their supervision, and do not fit into Armco's scheme of things.

The first and third groups are the ones which require the most personal attention. Obviously, it is good business to cultivate group No. 1; it is equally obvious that something must be done about group No. 3. After the individuals who comprise this group receive special personnel attention, they again resolve themselves into two classes—the chronic misfits who have no right to remain in the plant, and the good men who have been temporarily disturbed. Not infrequently some of the members of the latter group progress until they become members of group No. 1, after their difficulties have been smoothed out by their supervisor and the personnel department.

Inventory of Supervisors

Armco has adapted the personnel audit to serve still another purpose—an inventory of supervision. Due to the fact that our continuous process is comparatively new in the industry, it has been necessary that we do our own supervisory training. If some department in a plant is weak on supervision while unusually strong supervision obtains in the same department in another plant, then we must move some one from the latter plant to the former. Similar conditions may be discovered in departments in the same plant, where a man's experience may qualify him to be moved into another department needing additional supervision.

Armco's plan of personnel administration provides for a personnel department in each plant and a central personnel staff at the general offices, reporting to the president, which coordinates the work. Copies are made of the audits on the supervisory group in all plants as well as the records of those adjudged ready for promotion to supervisory positions. They are assembled into a volume called the "key-man book," which enables the staff to tell at a glance the qualifications of the various supervisors in all plants.

Moving men from one plant to another sometimes involves some diplomatic persuasion, for it must be remembered that the personnel job is a staff position which carries no line authority. Besides, after a superintendent has trained a foreman, it would certainly be excusable if he were reluctant to transfer his capable assistant to another plant to assist another superintendent who has neglected to do likewise. It doesn't sound reasonable to penalize one man for another man's neglect, but the best interests of the company must be kept in mind. Should we run into such a situation—and it is rare, as most superintendents like to see their men progress—the first superintendent may employ some subterfuge to retain the good man, such as stating that he is incapable of filling the proposed position. If he is referred to the personnel audit, which is in most cases the superintendent's own evaluation, such an objection can easily be overcome.

The "key-man" record in normal times is checked every month, so we have constantly before us an up-to-date "man inventory" which shows at a glance the quality and quantity of our leaders.

In periods of depression and declining organization, such as the industry has experienced in the last two years, the audit has been of exceptional assistance. It isn't uncommon for superintendents or foremen to ask to see the audit on their department when considering reductions in forces. Likewise, when planning reductions in conjunction with the plant employment supervisor, the departmental audit is used as a reference in deciding who should be retained.

Some day the science of personnel management, which is not at all confined to the personnel department, may advance until it can devise some accurate means of measuring human beings. Armco's personnel audit is by no means perfect; its imperfections are largely the common defects in human judgment. However, it does represent an effort toward organizing, centralizing and making available information on a problem which is regarded as a vague intangible. The audit has proved its value to us many times over, for it gives us at a glance a running inventory of the entire Armco organization; it tells us where the individual and the company require additional strength; and it points out the men in our own ranks capable and available to fill these positions. It is in effect an annual statement of organization.

Are General Price Levels Predictable?

(*Concluded from page* 621)

prices fell. From 1907 to 1915 the volume of credit increased by almost exactly 4 per cent a year, the rate of rise of production, and in those years the general price level remained stable.

Mathematical Determination of Prices

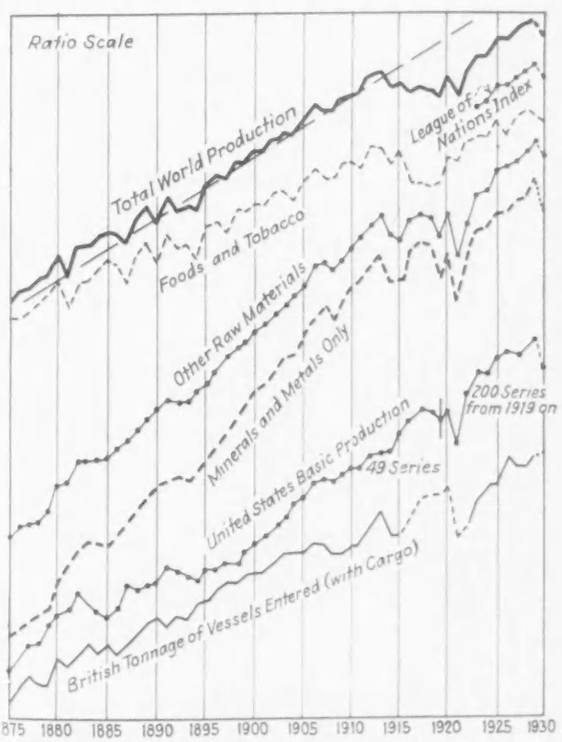
This relationship between volume of production and trade and volume of credit is one of the most important discoveries ever made by the statistician. It implies a mathematical relationship between volume of production and credit, on the one hand, and the price level, on the other. In fact, by dividing each given volume of credit by the corresponding volume of production, the level of prices at any particular moment is approximated. The fourth line in this chart is the ratio between volume of credit and volume of production, or a theoretical price level secured by this mathematical process and without the use of any quoted prices whatever.

The closeness with which the line showing the theoretical price level corresponds with the actual price level is a remarkable verification of the quantity theory of money. The index of prices used here is one which gives weight to all types of prices, and is not the more generally used index of wholesale prices.

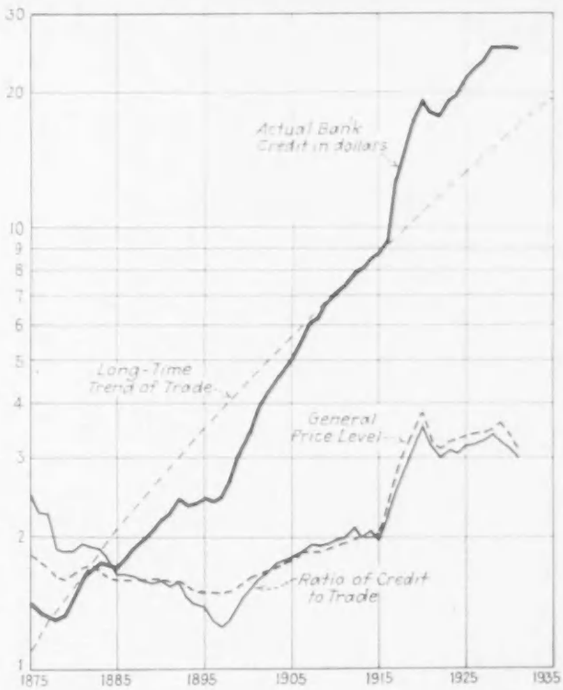
When volume of credit is increased more rapidly than production, prices rise; when production increases more rapidly than volume of credit, prices fall. Neither process, unless carried to extremes, as in 1920-1921 and 1930-1931, has a noticeable influence upon the total volume of world production.

What is the inference to be drawn from the facts outlined? Can it be that, had the growth of credit paralleled the increase in volume of production and trade, there would have been no substantial changes in the general price level, no major business cycles, no booms, no severe depressions? This startling concept affords hope that the social injustices inherent in all major changes in the general price level might be avoided by proper control of credit.

This counsel of perfection is not fully attainable in human affairs. But it is clearly within the power of the great central banks, through appropriate interest rates and open-market policies, to control within reasonable limits too rapid increase in the volume of credit, and also to prevent contraction of the normal growth of credit which is the basis of the present world tragedy.


Ratio Scale
Total World Production
League of Nations Index
Foods and Tobacco
Other Raw Materials
Minerals and Metals Only
200 Series from 1919 on
United States Basic Production
49 Series
British Tonnage of Vessels Entered (with Cargo)
1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 1925 1930

Total world (and United States) production for 55 years, showing influence of agricultural output upon year-by-year fluctuations.



Relation of trade to credit, as a measure of general price levels in the United States.

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FOLLOWING the lines laid down some years ago, the 1930 statistical report on iron and steel covers particulars of production and prices in a volume of 126 pages. Most of this is presented in the manner with which we have long been familiar. Compared with last year's volume there have been two additions, (1) a list of steel works abandoned or dismantled in 1930, and (2) the average daily blast furnace production, by districts. This latter has gone up from 501 tons in 1926 to 603.5 tons in 1930, for each furnace active.

Tabular matter fills practically the entire volume. As in former years, there are sections covering pig iron and ferroalloys, steel ingots and castings, rolled iron and steel, production of certain specified rolled items, iron ore, coal and coke, output of various production districts, imports and exports, average monthly and yearly prices, statistics for Canada, and foreign statistics for iron ore, pig iron and ferroalloys, and steel ingots and castings.

Price, bound in cloth, is $5. The book may be obtained from the American Iron and Steel Institute, 75 West Street, New York.

ANCIENT VOLUMES IN VATICAN PROTECTED BY STEEL SHELVING AND AIR CONDITIONING

AN American company was awarded the contract to install all-metal library book stacks and air-conditioning in the library of the Vatican. Pressed steel shelves and cast iron supporting members, made in Jersey City, N. J., are providing a strong, durable installation. In the air-conditioning, of American origin and design, the "zigzag" system, so called, has been employed.

The Vatican library is considered to be one of the most valuable of the world's libraries and Pope Pius XI is endeavoring by increasing its accessibility to make it available in its entirety for research by scholars throughout the world.

MODERN metal library shelving and air-conditioning equipment is being installed by an American company in a section of the Vatican, constructed in 1512. The building, on the Courtyard of the Belvedere, is a gallery built against an 8-ft. wall of the fortifications used when the Vatican was a citadel. The metal shelving will provide space for about 50,000 manuscripts, 10,000 bundles of archives, nearly 7000 incunabula, and 450,000 volumes, and will permit expansion to a maximum of about 600,000 volumes.

Both metal shelving and air-conditioning equipment are being installed by Snead & Co., Jersey City, N. J., who began business as a foundry in 1849 and have for nearly half a century specialized in library bookstack installations on a large scale. The first Vatican installation by this company was completed in 1929 on the ground floor of a building formerly used as a stable. In this gallery, 272 ft. long, 18 ft. wide and with a vaulted ceiling 39 ft. in height, three tiers of shelving were built, and an American air-conditioning system was installed.

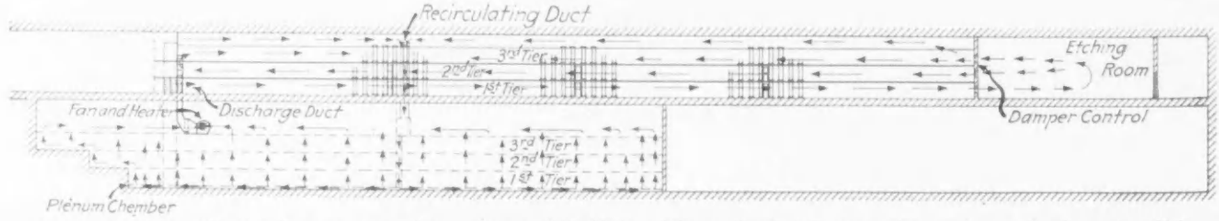
The supply fan, which provides a change of air every 10 min., is on top of the third tier and draws fresh air through an adjacent oval window. The indrawn air is cleaned by passage through cellular filters and is heated when necessary by banks of hot-water radiators. It is automatically moistened to provide 50 per cent humidity and maintained at about 65 deg., Fahr. The conditioned air is delivered to a plenum chamber under the floor of the first tier. From this it rises through slots along the walls in front of the shelves until it reaches the third tier, where it is in part expelled and in part recirculated.

The shelving is standard design installed by Snead & Co. in other large libraries, including the Library of Congress, Washington. It has been developed with the intention of providing maximum safety in the storage of books, which are affected, especially in warmer climates, by atmospheric conditions and attacks of destructive insects. Support of the total weight is dependent upon a built-up section, the central part of which is a 1 x 4 x ⅛-in. special steel shape. The shelf supports, bolted to this frame, are 10-in. cast iron channels with a series of lugs cast on the inner side, upon which the shelving may be placed as required to fit the books.

After casting, the shelf supports are sand blasted, surface ground and filed to furnish an even and smooth surface for the application of a protective coating, the final finish being a light gray enamel. As the cast-iron ends and steel shapes are solid, they offer no harbor for dust or insects.

Installation Adds 14,000 Shelves

The shelving is also designed to be insect proof and consists of a series of hollow, inverted U-shapes, 3 ft. to 3 ft. 6 in. long, formed of No. 22 gage strip steel interlocked with pressed steel end-members. Opening downward and set on a metal frame with slight intervals between, these half rounds offer no satisfactory lodging for dust or insects. When finished the shelves receive two coats of ebony black japan and are baked for 1½ hr.



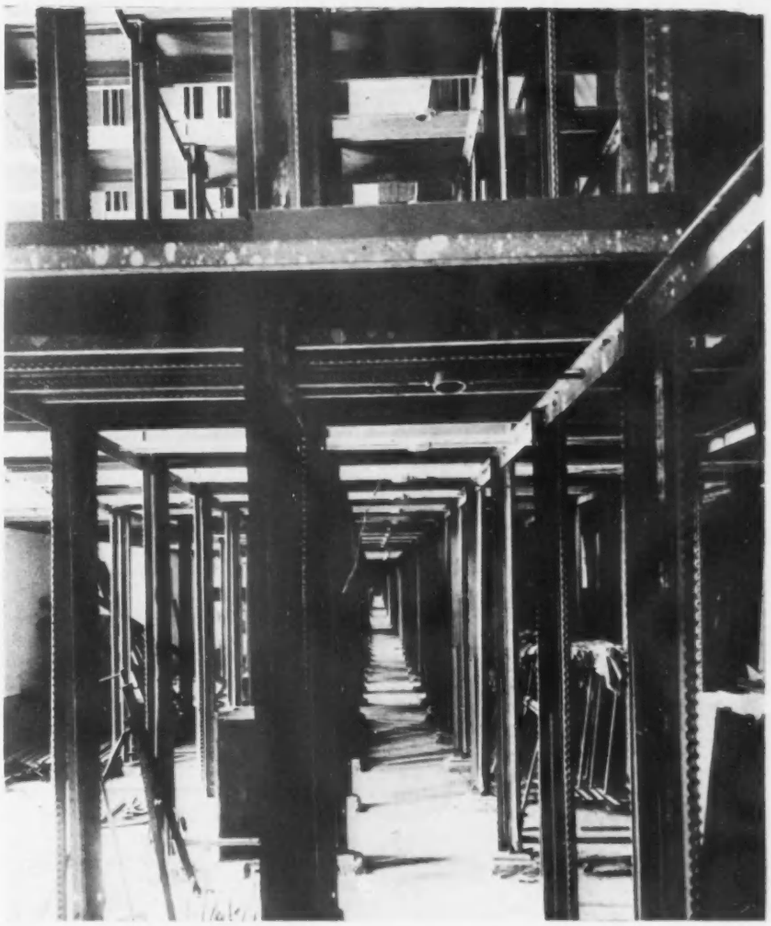
In providing air-conditioning for a new, second-story section of the Vatican Library, the first tier is used as a plenum chamber, into which the air is discharged by a blower, after completing its circulation through the ground-floor tiers.

at a temperature of about 380 deg. Fahr.

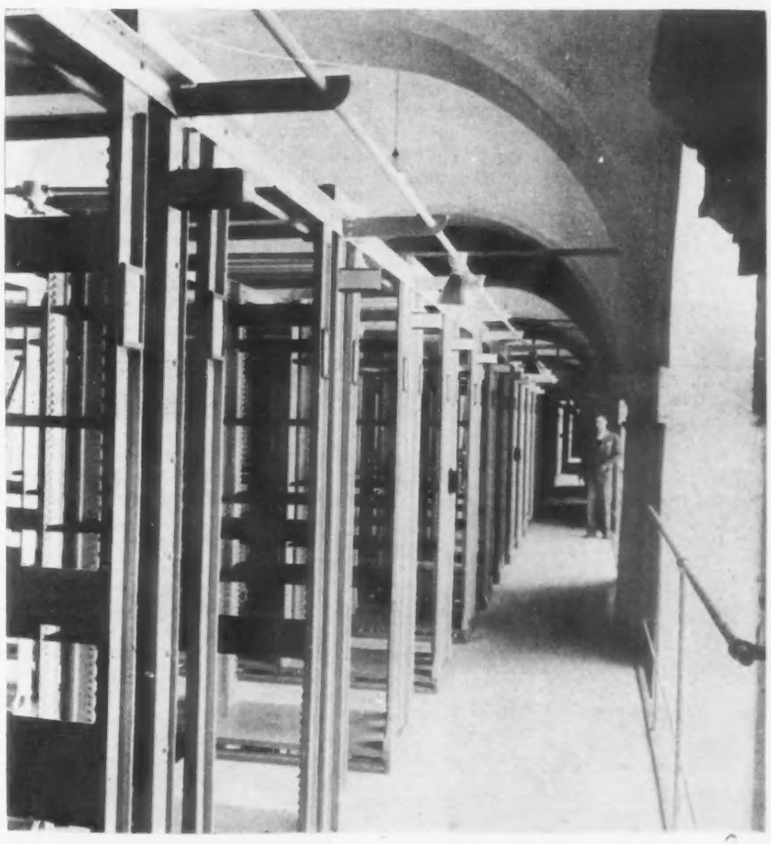
The present Vatican installation, slightly more extensive then the original, is in the old mosaic factory, directly above the first and adds about 14,000 shelves. The gallery is 415 ft. long, 18 ft. wide and has a vaulted ceiling 31 ft. 6 in. in height.

In this section, Snead & Co. have departed slightly from the usual practice in provision for air-conditioning, using what they term a "zigzag" system, by which the air is changed every 8 min., after drifting through the corridors and tiers of shelves. The original installation for the ground floor library is being used, with the addition of fans and motors to increase capacity.

The accompanying diagram shows both the old and new sections. Instead of withdrawing the air when it has risen to the top chamber of the ground floor library and recirculating it through the plenum chamber under the floor, the air is permitted to pass along the top passage



THE new Vatican library section ready to receive part of the great library of 450,000 volumes. The shelves are fabricated of pressed steel U-shapes with intervals between to permit circulation of air.



TIERS of book stacks nearing completion with the cast iron shelf supports in place, ready for attachment of the pressed steel shelving to the lugs cast in the edges.

to a reheater, and a booster blower discharges it at a velocity of 300 ft. a minute into the first tier of the upper stack. The air drifts 415 ft. into the etching room at the end of the passage, where the ceiling has the full height of 31 ft. 6 in. From this room it passes back into the two new upper tiers and then into a recirculating duct, which draws it back again into the lower air-conditioning chamber.

Air Drifts Through All Tiers

As each tier is shut off from the one above and below, except for adjustable openings along the walls, the air must drift in the predetermined direction, following a long path across the entire area of each tier instead of a short upward path, as in the original installation. This drift is said to be rapid enough to keep the air in motion, but not so rapid as to create serious friction with the book ranges. Practically all loss of static pressure comes from leakage, rather

than from friction, as the air passage areas are comparatively large.

As may be seen by the arrows in the accompanying diagram, the air, after reaching the etching room returns by the only open path, consisting of adjustable openings at the end of each tier overlooking the etching room. Retracing the 415 ft. to the other end of the tiers, it rises in the only course to the top chamber. Here it is drawn off by suction and with addition of a small volume of fresh air is recirculated through the plenum chamber under the ground floor. Thus the first tier of the upper section serves as a plenum chamber, instead of having such a duct under the floor with the usual vents, as in the original installation.

The first installation at the Vatican was started by Snead & Co. in 1928 and completed in 1929, and the present one will be ready for placement of volumes on the shelves by the end of this year, providing a twentieth century steel resting place in a sixteenth century building for volumes and manuscripts, many of which are centuries old.

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Production Gas Welding of Sheet Steel Cylinders

By EARL EVLETH

Service Engineer, Bastian-Blessing Co.

IN high speed mass production, individual small parts must reach the assembly line in perfect condition and at a uniform speed or the entire plan of production will fail. Fit-and-try methods of assembly cannot be employed. Parts must be inspected and tested at the earlier stages and imperfect materials rejected before the final assembly. Neglect of detail is ruinous. Under any system which permits neglect, production schedules fail and costs mount to prohibitive levels.

The Norge Corpn., Detroit, builder of electric refrigerators, introduced its unit into a highly competitive market. Price levels were already established which had to be met. The profit margin did not permit fluctuations in manufacturing costs. Strict maintenance of a producton schedule and low operating costs were essential. Failure of any detail of the plan meant loss of profit.

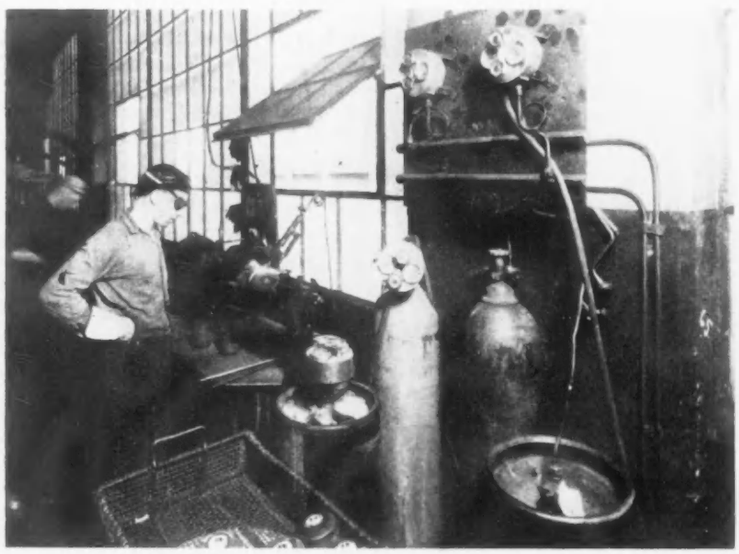
Among the numerous problems encountered was the fabrication of the refrigerant liquid receiver. This is a 14-gage steel cylinder 4 in. in diameter and 10 in. long made from two cup-shaped halves, joined at the center girth seam by welding. The original specifications required the use of the oxy-acetylene process with hand operated torches but difficulty was experienced from the start in obtaining uniform results in appearance and freedom from leaks. In addition to these troubles the production output varied from day to day. Semi-automatic electric welding was attempted but the results were not satisfactory and the idea was abandoned.

The problem was then submitted to the Bastian-Blessing Co., Chicago, manufacturer of Rego oxy-acetylene welding equipment. A special welding machine was built substantially as shown in the accompanying reproduction of a photograph. The production estimated by the Rego engineering department called for 41 completed welds an hour with a gas consumption of 0.59 cu. ft. of both oxygen and acetylene per piece. A change was suggested in the shell design to provide a projecting flange 1/32 in. high on each end of the receiver cylinder halves, thus eliminating the use of welding wire in the operation.

The machine consists of a horizontal spindle on which is mounted a quick operating chuck to hold one-half of the cylinder. The other half is held in alinement and contact by the tail stock collet. There is variable speed friction drive and gear reduction to the motor. The torch with a special multiple flame tip is mounted on a bracket arm above the work at an angle of 45 deg. The bracket arm has screw feed adjustments in two directions to permit proper location of the welding flame in relation to the weld seam.

The machine is semi-automatic in operation. The direct current motor is connected through a rheostat permitting a slow start to bring the metal to fusion temperature, with increased speed as the weld progresses. Solenoid valves connected to the rheostat handle shut off the gas supply when the motor feed is stopped and an electric spark ignites the gases when the motor is started. The work revolves toward the operator so that the finished weld is always in full view. A uniform, steady flow of gas pressure is essential and this is supplied by Rego two-stage regulators.

Results over an operating period of several months show that the actual production of finished welds averages 45 pieces an hour with a gas consumption of 0.53 cu. ft. each of oxygen and acetylene per piece. The machine, which is now operating on two shifts, has reduced the cost of the operation more than 50 per cent. All of the receivers are subjected to a hydrostatic test pressure of 1500 lb. per sq. in. with less than 1 per cent rejects for leaks. The weld is smooth and uniform and requires no grinding or finishing before enameling.



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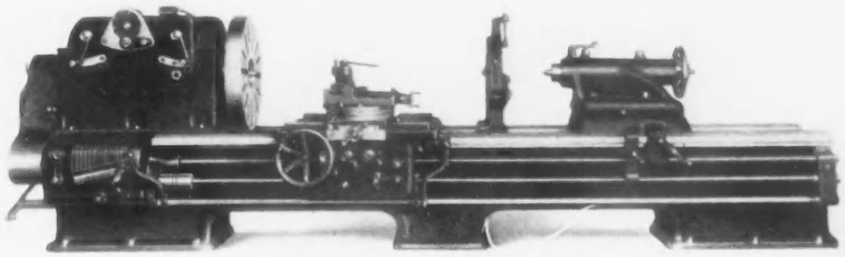
Ohio River Shipments Lower in July

Shipments of iron and steel products on the Ohio River in the Pittsburgh district during July amounted to 39,300 net tons, according to the United States Engineer office, Pittsburgh. This is a decline from the 46,945 tons shipped during June, and represents a decided falling off from the 147,558 tons moved in July, 1930. On the Monongahela River, July iron and steel shipments totaled only 21,917 tons, compared with 21,340 tons in the preceding month and with 132,161 tons in July, 1930. July shipments on the Allegheny River amounted to 717 tons, against 500 tons in the previous month and 1125 tons in the corresponding month last year.



"Tritrol" 30 and 36-In. Heavy Duty Engine Lathes

DIRECT reading 16-speed control, entirely inclosed anti-friction self-oiling gear box, anti-friction end gearing and an anti-friction centrally oiled apron are developments included in the construction of new 30 and 36-in. heavy duty lathes manufactured by the Sidney Machine Tool Co. Sidney, Ohio, and distributed by Joseph T. Ryerson & Son, Chicago.

A feature emphasized by the company is the method of guiding and holding the carriage to the bed. The carriage is guided by large V-ways, front and back, and there is a wide flat bearing under the bridge where the tool pressure comes. Gibs on square guides in the center of the bed are designed to keep the carriage from lifting under heavy cuts and serve to strengthen the bridge. The bed, which is of four-wall construction, is cast from 0.50 to 0.60 per cent carbon alloy steel with 1 per cent nickel content.

The headstock is herringbone geared and all bearings are adjustable for take-up from the outside without removing the cover. Lubrication is provided by a positive force-feed system. All drive shafts, as well as the spindle which is of exceptionally large diameter, are made from alloy steel forgings. Sudden spindle speed changes are possible without damage to work, tool or machine. The gear box is dust and chip-proof.

Anti-friction bearings are provided on the heavy double-walled apron. The non-revolving snap lever apron controls are of the patented "Tritrol" type, designed for ease of action without slipping out of engagement under heavy cuts. Reverse to all feeds can be obtained by a lever on the apron without reversing the spindle.

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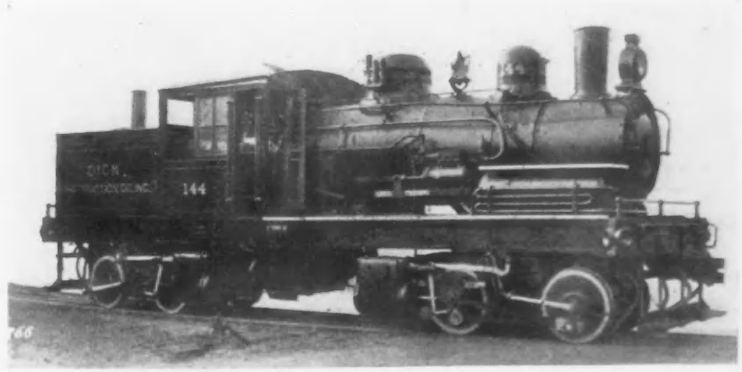
"Duplex" Industrial Locomotive

A NEW type of locomotive, said to be the first of its kind built in America, has been brought out by the Vulcan Iron Works, Wilkes-Barre, Pa. This duplex locomotive meets the demand for a comparatively heavy steam locomotive, distributing the weight over a great length of rail and number of ties.

This is especially adaptable to all conditions involving handling heavy loads on steep grades, with sharp and kinky curves, on poorly laid track. It has an advantage over the simple locomotive of rigid-frame wheel-base in having two swiveling trucks, enabling it to negotiate sharper curves and provide for greater traction on poorly constructed roadbeds.

As illustrated, the locomotive weighs 55 tons in full service order, with the weight distributed over eight driving wheels. Each swiveling truck has a pair of 13 x 16-in. piston-valve-type cylinders, with valves controlled by Walschaert gear. Each truck is a complete unit in itself and obtains its steam through flexible connections from the boiler.



Driving wheels are 33 in. in diameter; truck wheelbase, 5 ft.; total wheelbase is 26 ft. 5 in. The locomotive over bumpers measures 32 ft. 6 in.

The main locomotive frame is of heavy structural steel, tied together with heavy cast steel bumpers and cross ties and provided with standard A. R. A. automatic couplers. The boiler is of extended wagon-top type, with charcoal iron tubes. It gets its water supply from the rear tank by means of a feed pump and also an injector. The working pressure is 200 lb. The water tank, located over the rear engine truck, holds 1400 gal. and is equipped with a feed-water heater. Space is provided for approximately 5000 lb. of coal.

Tractive effort developed under preliminary tests showed a reading of upward of 30,000 lb.

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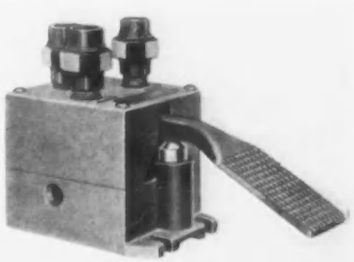
New Foot-Control Air Valve

WITH no springs used for the pedal return, the new model GN single-pedal reversing type foot-control air valve recently brought out by the Logansport Machine Co., Logans-



port, Ind., eliminates one of the causes of valve failure. A small air piston mounted under the foot pedal automatically returns the pedal and reverses the valve when the operator removes his foot.

The foot pedal has been designed to conform to the natural position of the foot; it is not necessarily for the operator to raise his foot off the floor, and operation of the valve does not cause fatigue. The valves are manufactured in pipe sizes ranging from ⅜ to 1 in.

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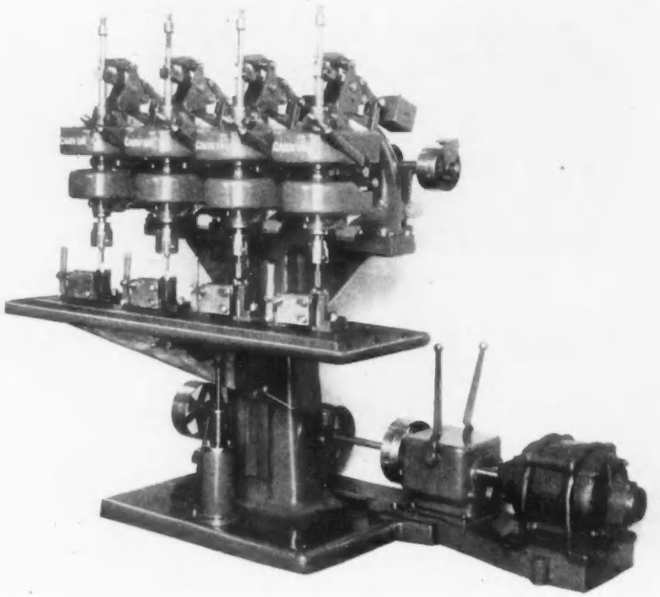
Budd Wheel Co., Detroit, has purchased from Surface Combustion Co. a pusher continuous heating furnace of the diffusion flame type.

Four-Head Automatic Tapping Machine



THE Western Machine Tool Works, Holland, Mich., has added to its line a Garvin No. 2-X four-head Timken roller-bearing equipped automatic tapping machine designed to permit rapid tapping of four different sizes of holes.

The machine illustrated is furnished with a four-change speedbox, and is employed for tapping steering knuckles; the jigs used with it are shown clamped to table of machine. One of the heads is arranged for left-hand drive. A telescoping screw is provided to facilitate raising and lowering the table, which is heavily constructed and is provided with Tee slots for securing work-holding fixtures. Under the table there is a Y-shaped web which provides a knee that is both light and rigid. The table is secured to the V-bearing of the heavy box-section column by means of a screw which pulls a tapered clamp up against the back of the V-bearing, affording a rigid locking mechanism.

All the moving parts are mounted on Timken tapered roller bearings. Although powerful and designed for high speeds, the machine is sensitive enough to prevent tap breakage. It is automatic, in that nothing further is required of the operator than to pull the starting lever until the tap is engaged in the work; the machine automatically completes the operation, tapped exactly to the predetermined depth. Each head has a capacity for driving ¼ in. to ⅞ in. U. S. S. tap in cast iron, or from ¼ in. to ¾ in. in steel. Pipe tap capacity is ½ in. in cast iron, and ⅜ in. in steel.

lieved end to permit the grinding of flat surfaces and blind holes. Two of the shapes can be used for die grinding, in forming the teeth of special cutters and for sharpening small circular tools. The standard copper-coated spindle used in this production set is ⅛ in. in diameter and 1⅜ in. long. For dental hand pieces, spindles 3/32 in. in diameter, 1⅛ in. long, can be furnished; for certain types of grinders and flexible shaft machines, spindles ¼ in. in diameter and 1½ in. long can be supplied.

This production set, designated as the No. 824, is offered for use where portable grinders are employed; it is not only practical, but is economical because of the fewer number of shapes and sizes applicable to a wide range of work. It is furnished packed in a convenient container.

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Set of Mounted Grinding Wheels and Points

FOR the general run of grinding jobs on various types of portable grinders, the Carborundum Co., Niagara Falls, N. Y., is offering the production set of mounted wheels and points here shown.

These wheels and points are made of Aloxite Brand aluminum oxide, and their shapes and sizes and grits and grades have been selected to meet the requirements of the average plant as determined by considerable study in this field of grinding. The wheels and points are made and mounted to run true, and the spindles are copper coated to assure a more secure mounting and provide a rust-proof spindle.

Included in the production set are two rubber-bonded polishing wheels that can be used for giving burnished surfaces on all metals without loading and filling. In each set also is a Carborundum Brand dressing stick for general dressing or for changing the shapes of the wheels to meet special conditions.

The plain wheel shapes have a re-

When Not in Use
Keep these ALOXITE BRAND MOUNTED WHEELS in this box
Product of
THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y., U. S. A.

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A CONVENIENT set designed to permit a wide range of work with a limited number of shapes.

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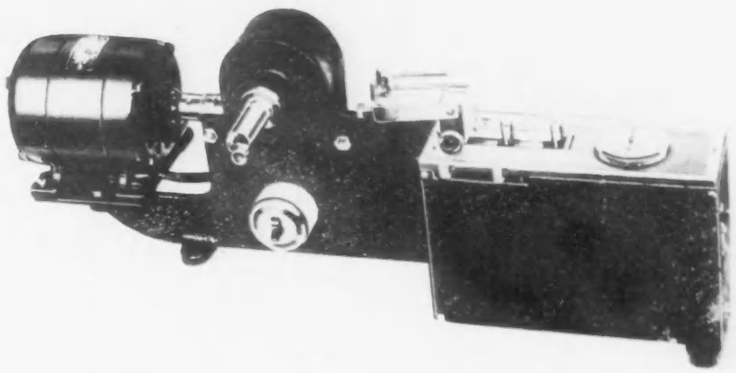
Plant Visitations During National Metal Week

Eight plants in the metropolitan Boston area will be visited by the engineers attending the National Metal Congress and Exposition to be held there the week of Sept. 21.

Watertown Arsenal will be visited the morning of Sept. 22. The following day officials of the Fore River plant of Bethlehem Shipbuilding Corpn. will escort groups through the repair docks, forge plant and other departments. An optional trip is to the plants of the Boston Gear Works and Pneumatic Scale Co.

On Sept. 24, the River works of General Electric Co. will be open to inspection. An alternative trip is to Naumkeag Steam Cotton Co. at Salem. The United Shoe Machinery Co. or the Trimont Mfg. Co. may be visited on Sept. 25.

Tests Efficiency of Wire Drawing Dies



AN instrument known as the Triplex dynamometer, for testing all types of wire drawing dies, including diamond and tungsten carbide, has been brought out by Robert Miller, 221 North Twenty-third Street, Philadelphia.

The machine is arranged to indicate accurately the traction required to draw the wire through the die, and also the ultimate breaking point of the wire; the ratio between the traction and the breaking point figures is an indication of the efficiency of the die.

There are three scales, one reading from zero to 1 lb., in hundredths of a pound; another from zero to 10 lb., and the third from zero to 100 lb. The machine as here illustrated is 25 in. long, 8½ in. high, and weighs 38 lb.

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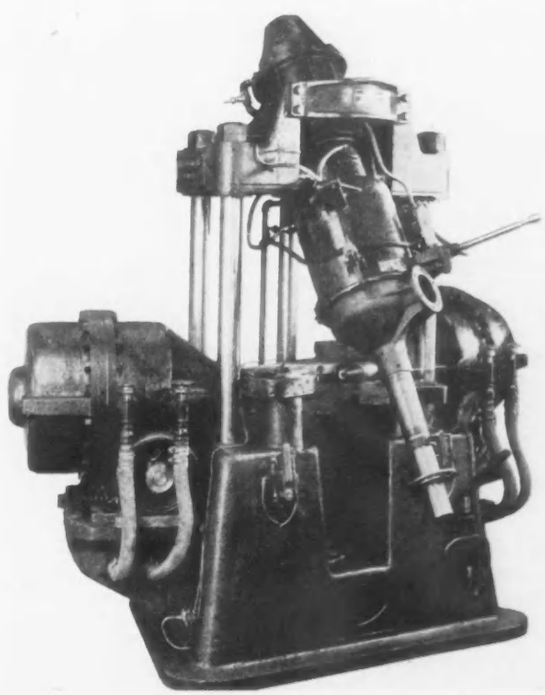
Multiple Riveter for Truck Axle Housings

A SINGLE-PURPOSE riveting machine, designed especially for riveting rear axle housings of Ford trucks, has been built by the Hanna Engineering Works, 1765 Elston Avenue, Chicago. In the accompanying illustration a housing assembly is shown clamped in the loading position. These clamps are power-actuated and the workholder is arranged to swing into alinement with the rivet dies where it is secured by a power lock.

The rivets are inserted from the outside and headed on the inside. Four rivets attaching the axle tubes to the differential housing are driven simultaneously, following which the assembly is indexed and the remaining four rivets are driven. In forming the heads a predetermined tonnage is exerted equally on all rivets.

The expanding heading mandrel is designed to compensate automatically for variations in the inside diameter and eccentricity of the axle tubes. Power actuation of the mandrel expedites loading and unloading.



THE illustration shows a Ford truck rear axle housing supported in the loading position. After the workholder swings into alinement, four rivets are headed simultaneously under predetermined pressure.

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Sodium Metasilicate for Industrial Cleaning

PROPERTIES and industrial cleaning uses of sodium metasilicate are outlined in a booklet being issued by the Philadelphia Quartz Co., 121 South Third Street, Philadelphia. The booklet is a reprint of a paper on "Sodium Metasilicate As an Industrial Alkali," presented by J. G. Vail, chemical director of the company, before a meeting of the American Institute of Chemical Engineers.

Although in basic ingredients this salt is the same as the more familiar forms of silicates of soda, its properties and uses are quite different. The alkalinity of sodium metasilicate is high. The material is very soluble and has free rinsing properties; it is said to be much more easily rinsed out than soap. Oil rags or cotton waste used in the machine shop or cloths stained with paints or nitrocellulose lacquers can be reclaimed with metasilicate without the aid of soap. Metal and other washing machines that become incrusted with reaction products of hard water and alkalies are said not only to fail to accumulate such deposits when sodium metasilicate is used with the same hard water, but the old scale tends to soften and come off.

The heaviest industrial cleaning is usually in the removal of mineral oil, and in this connection Mr. Vail points out that strong alkaline solutions are used, generally with additions of rosin or other soaps, although most machines for washing parts by a cascade principle require detergents that do not foam. Metasilicate solutions are of this type, he states and with them it has been found possible to work at such low concentrations that appreciable economies are experienced.

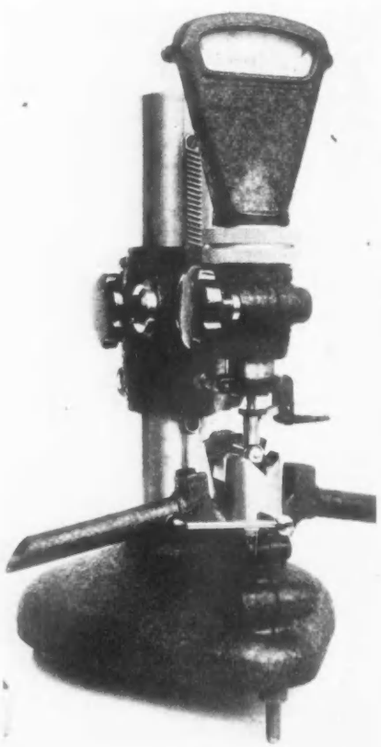
Since Mr. Vail's paper was presented, the company has announced the same salt in a new and better form under the name of "Metso Crystals." These are uniform grains free from dust and readily soluble.

Comparator for Checking Steel Balls

A MICRO-INDICATOR stand designed for checking the diameter and roundness of steel balls has been placed on the market in the United States by the Société Genevoise d'Instruments de Physique, Geneva, Switzerland, through the R. Y. Ferner Co., Investment Building, Washington.

In this use of the stand a small pin is inserted under the front edge of the base to hold the stand in a slightly tilted position and a V block is used as a lower table of the apparatus. The balls to be tested are allowed to roll down this V groove to an adjustable stop. The fan-shaped micro-indicator used for these measurements is provided with a lifting clip by which the contact plunger can be raised to allow the ball to take its proper position. The plunger can then be lowered for the measurement. Adjustable tolerance marks can be set at any point over a range of 0.003 in. either side of the center.

When it is seen, by the reading of the micro-indicator whether the ball in position is within or without the tolerance, a lever can be thrown to the right or left to eject the ball to one or the other of two tubular troughs leading to receptacles for accepted and rejected balls. Since the balls are thrown out at the rear of the V groove, inspection of the balls may be very rapid, practically as fast as they can be fed in at the front of the apparatus. The micro-indicators used for this work have a knife-edge multiplication system of high accuracy and can be obtained graduated to as fine a reading as one twenty thousandths of an inch per division. The stand has capacity for balls between ⅛ and ⅝ in. in diameter.



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Packing Has Automatic Tightening Feature

PACKING consisting of a number of rings of V-shape cross-section is being marketed by the Garlock Packing Co., Palmyra, N. Y., for use on heavy-duty hydraulic equipment. Designated as No. 430 Chevron packing, it permits a plurality of rings to be inserted in shallow stuffing boxes that will not accommodate a suitable number of rings of ordinary packing. A shallow stuffing box is illustrated; for longer packing spaces, as many rings may be used as required.

The design provides automatic action, the elements packing tighter as the pressure increases. Chevron packing is furnished only in ring sets that include top and bottom adapter rings

conforming respectively with the gland and stuffing box bevels. No. 530 packing, of the same type and design but made of special heat resisting materials, is obtainable for high temperature service.

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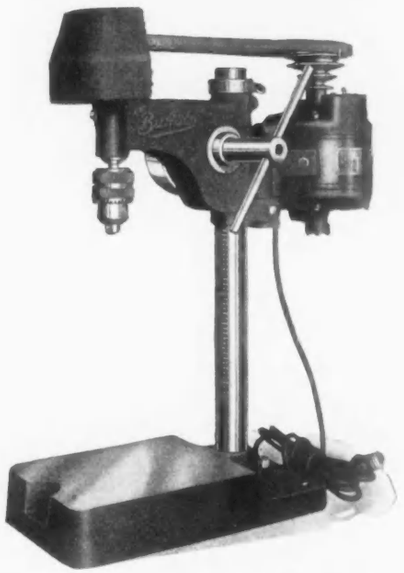
Conveniently Adjustable Bench Drill

THE Simplex bench drill illustrated, a product of the Buffalo Forge Co., Buffalo, will drill to the center of a 13½ in. circle. The entire head travels vertically on the column. The spindle is stationary and forms part of the head, which is counterbalanced and easily moved to the desired position. For low work the head may be lowered within 3 or 4 in. of the base and for odd-shaped pieces it may be raised to the upper part of the column a distance of 14 in. The head may be swung entirely around the column and locked in any position. Drive is through a V-belt with sheaves, providing spindle speeds of 855, 1210, 2380, and 3400 r.p.m. A built-in switch and extension cord are supplied.

The machine is regularly furnished with a drill chuck. A grinding attachment may be obtained that permits grinding wheels to be attached directly to the head or to be driven through a flexible shaft. Specifications include: Overall height, 26 in.; capacity, ⅜ and ½ in. with 1/6 and ¼ hp. motors respectively; vertical travel of head, 12 in.; and working surface, 8 x 10 in.; weight, 83 lb.



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Electrically Heated Steam Generators

STEAM generators for various purposes in outlying plants are being made by the General Electric Co., Schenectady, N. Y. These are said to be suitable anywhere in industry where steam is needed but not available in sufficient quantity or at suitable pressure. The line includes two pressure ratings—100 lb. and 200 lb. The units are made in various sizes and electrical ratings.

A standard unit consists of a suitable steel container in which are inserted one or more helical sheath-wire immersion heaters. Control equipment includes a magnetic switch and an automatic pressure governor operated in conjunction with a low-water alarm and automatic switch to shut off heat, and a device for automatically feeding additional water to the generator.

With such equipment the unit is completely automatic in operation and needs no supervision except periodic inspection. The normal rating of such an electric steam generator is its maximum rating. Additional capacity, however, for a brief period can be obtained by use of accumulator capacity. This is attained by raising a large volume of water to a pressure higher than normal and when this is needed providing steam therefrom through a pressure reducer.

These units are designed to operate on 115, 230 or 440 volts, with either direct or alternating current. The switches for each 5-kw. heater unit are so adjusted that a variety of ratings may be obtained from 1.25 kw. up, by increments of 1.25 kw.

September Automobile Production May Fall Below That of August

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DETROIT, Aug. 31.

AS the fall season looms, there is little in the automotive outlook to encourage the steel trade. August assemblies of motor cars are estimated at 175,000 to 180,000 cars, and indications point to a decline in production during September. It was believed a few weeks ago that August would mark the low point for the year, but it now seems that the coming month is to have that dubious distinction. It is too early to make an accurate estimate, but it will be surprising if output in September is more than 160,000 cars. This is based on the fact that both Chevrolet and Plymouth, which have been doing much to hold operations at the current level, have scheduled sharp curtailments, while Ford is not likely to get manufacturing activities at the Rouge plant in full swing until late in September.

Although the prospective failure of September to take a forward stride is disappointing, it must be remembered that this year's performance is in accord with that in recent years. Not since 1925 has September bettered the August figure; in 1930 there was only a slight margin separating the two months, August with 234,160 cars and September with 228,606. Unless there is an unexpected upward turn, third quarter production this year will be about 560,000 cars, compared with 738,487 cars in the same period of last year. With the industry at low ebb, it is natural its eyes should be directed toward the fourth quarter, when it has an excellent opportunity to top its 1930 record. Last October, November and December total assemblies were only 462,426 cars. Just how small this was can best be realized when it is put alongside the single month of March, 1930, when 468,281 cars were turned out. With Ford manufacturing new models, facing the necessity of stocking dealers as rapidly as possible, this alone should go a long way toward surpassing the industry's mark in the fourth quarter of 1930.

August motor car output in United States and Canada placed at 175,000 to 180,000 units, September at 160,000. Third quarter production estimated at 560,000 cars, against 738,487 last year.

* * *

Production of revised model A Ford not expected to get into full swing until latter part of September. Ford has not given any steel releases for the coming month.

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Chevrolet's 1932 car not expected until December. New transmission, probably Bendix clutch control eliminating use of left clutch pedal, will be a feature. Chevrolet's August assemblies were 55,000 to 60,000 cars. September will be "clean-up" month for present models.

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Plymouth's August production estimated at 28,000 cars, September at 18,000.

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Ford's Plans Still a Mystery

Ford continues the focal point for discussion in Detroit. What is actually happening at Dearborn is just as much a mystery now as it was a month ago, due to Mr. Ford's success in completely silencing his lieutenants. However, it is known that no steel, except minor quantities for experimental runs, has been released, and shipments to Rouge probably will not be resumed until the latter part of September. That is, Ford did not make a monthly "buy" for next month, as is its custom. Incidentally, Ford's purchases of steel have been meager since early in the spring, when it over-bought and built up a considerable stock. The Ford steel mill at Dearborn has been idle since July 1 and apparently operations will not be started again in the immediate future. The two blast furnaces are running this month on basic iron, piling up material in the yards in anticipation of open-hearth needs during the fall.

That production of motors and other parts on a large scale at Rouge should not get under way on Sept. 1, as anticipated earlier, is not surprising. It must be remembered that the change-over from model T to model A took almost a year and the prospective alterations in the latter cannot be made overnight. The fact that present changes are likely to be accomplished during a comparatively short period speaks well for the adaptability of the Ford methods, long held up as an example of the inflexibility which is supposed to go hand in hand with mass production. It is understood that the number of workers now employed at Rouge is about 35,000, and the company has started to recall workers, a few thousand having been ordered to report Sept. 8. The normal working force at Rouge is 80,000 men. The assembly of cars at branch assembly plants continues, but it is impossible to tell what the volume is. Several well-informed observers put the August output at 40,000 to 45,000 cars. So far as the revamped model A is concerned, it is thought that major changes will be a bigger car with longer wheelbase and effective means of eliminating vibration. The latter is the biggest selling feature of the new Plymouth. However, the talk about Ford paying a royalty for the use of the Chrysler-patented "floating power" is generally discounted locally.

Aside from Ford, interest centers on what Chevrolet will do. It has been assumed in certain quarters that Plymouth's entry into stronger com-

petition in the low-priced field has had the effect of speeding up Chevrolet's plans for its 1932 models. It can be stated with authority that this is not the case. Next year's car will not be announced until some time in December, unless the present program is changed. Official announcements will be made about the same time or possibly a week or two later than last year. A major improvement will be in the nature of a new transmission.

It is not considered likely that free wheeling, as it is now known, will be adopted, but in its place Detroit believes that the newly-developed Bendix clutch control will be installed as standard equipment. The Bendix process vests control of the clutch mechanism in the accelerator, making it possible for the driver to start, stop and shift gears without touching the clutch pedal. In the words of Bendix engineers, "the left foot has lost its driving job." The device operates by action of the accelerator and obtains its power from a vacuum created by the intake manifold. Bendix claims that the device, which is being made on a quantity basis at its South Bend, Ind., plant, is as important to the industry as the self-starter and four-wheel brakes and will bring about just as much of a revolution in car operation. As General Motors has a controlling financial interest in Bendix, it is thought that the clutch control will be put on the Chevrolet and possibly other General Motors cars as an answer to the free wheeling offered by competitors.

Meanwhile, Chevrolet manufactured 55,000 to 60,000 cars in August, but will decrease its output substantially during September, which might be termed a "clean-up month" for current models. The Chevrolet gray iron foundry at Saginaw is operating three days a week, pouring about 500 tons of iron a day, but will be closed shortly to prepare for production of 1932 work. It usually is down the last two weeks of September for this purpose, although there is a possibility that the shutdown this year may start before the middle of the month.

Plymouth Schedules Lowered

Plymouth's output in August is put at 28,000 cars, with a reduction to 18,000 set for September. It is possible, however, that an upward revision may be made before the end of the month, as the company is generally conservative in laying out its program. It is understood that the stocking of dealers has been completed and future manufacturing operations will depend on the trend of retail sales. The Buick factory at Flint will be closed for three weeks in September while the tooling up for the new car is in progress. Other companies are engaged in preparations for next year's offerings, but no authentic information about them is available.

Marmon has announced a new line of custom bodies on its 16-cylinder car, making a total of 40 body styles on this model. DeVaux is adding free wheeling to its six-cylinder cars which are being assembled at Grand Rapids, Mich., and Oakland, Cal. During the period of lean automobile production, Continental Motors Corpn. is concentrating all manufacture at its Muskegon, Mich., plant in order to take advantage of economies which can be effected by this change.

In July, 83 automobile companies in Michigan employed 160,057 workers, compared with 179,921 in June and 203,403 in July, 1930. The effect of light operations on the earnings of the workers is seen in the aggregate weekly payroll in July, which was $3,615,819, against $5,071,179 in June and $6,035,673 in July, 1930. Average weekly earnings in July were $22.57, compared with $28.20 in June and $29.70 in July of last year.

Packard has leased a factory building in Windsor and hereafter will make cars for the Canadian trade there instead of in Detroit. Among the companies which have begun the manufacture of cars in Canada since the Canadian tariff was increased sharply are Nash, Reo, Graham-Paige and Studebaker.

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Automobile Trade in 1929 Was $1,314,936,000

WASHINGTON, Sept. 1. — Sales amounting to $1,314,936,000 were made in 1929 by 1145 plants engaged primarily in making motor vehicle bodies and parts, of which $1,102,560,000, or 83.8 per cent, represented sales to users, including manufacturers of complete automobiles, operators of fleets of trucks, private owners, etc., according to the Census of Distribution.

This classification, the bureau reports, may include some interplant transfers, for a few of the manufacturing plants reported such transfers as sales to industrial users. Manufacturing plants sold 1.8 per cent or $23,105,000 worth to their own wholesale branches for resale to dealers and industrial users.

The remaining sales were made as follows: To wholesalers, 10.8 per cent, or $142,232,000; to retailers, 3.6 per cent, or $47,039,000. Of the sales to dealers and industrial users, $33,066,000 was made through manufacturers' agents, selling agents, brokers or commission houses. One hundred nineteen manufacturing plants sold through such agents, 28 of them selling their entire output in this way.

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218,961 Motor Cars Built in July; Drop of 31,696

WASHINGTON, Sept. 1.—The production of motor vehicles in the United States in July totaled 218,961, a drop of 31,696 from June, according to reports to the Bureau of the Census. The passenger car output was 182,927, a decrease of 26,028; the truck production was 35,854, a decline of 5488, and the taxicab output was 180, a drop of 50 per cent, or 180 under the June output of 360.

Total production of motor vehicles in the first seven months of the current year in the United States was 1,791,913, a drop of 672,200 from that of the corresponding period of last year. The output of passenger cars declined 604,392 to 1,497,798, while the truck output dropped 86,800 to 291,119. The taxicab production declined to 2996 from 5004.

Canadian production of motor vehicles in July totaled only 4220, against 6835 in June. The passenger car output was 3151, compared with 5583, while the truck production was 1069, against 1252. The total Canadian production of motor vehicles in the first seven months of 1931 was 70,312, against 120,873 in the corresponding period of last year. The passenger car output was 55,962, against 101,915, and the truck output declined to 14,350 from 18,958.

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Blast Furnace Owners Use Three-Fourths of Product

WASHINGTON, Aug. 31.—The 1929 value of products from blast furnaces operated by 105 plants reporting to the Census of Distribution totaled $771,425,000, of which only 25.7 per cent, or $198,254,000, was sold. The remaining 74.3 per cent, or $573,171,000, was consumed by the producers.

The report of the Bureau of the Census says that 74.2 per cent, or $147,068,000, of the sales went to industrial users, such as foundries and other makers of iron and steel products. Manufacturing plants sold 3.8 per cent, or $7,566,000 worth, of their products to their own wholesale branches for resale to dealers and users. The remaining 22 per cent, or $43,620,000, was sold to dealers.

Of the sales to dealers and users, $82,027,000 was through manufacturers' agents, selling agents, brokers, or commission houses. Forty manufacturing plants sold through such agents, 20 of them selling their entire output in this way.

The report states there are 105 plants included in what is called the blast furnace industry. Of these 105 plants, 10 transferred their entire output, or consumed it at the plant. The report shows the sales channels used by the 95 plants which reported sales. Sale of other products, including slag and electric current, is included in the report.

Illinois Commission Forbids Freight Rate Rise

The Illinois Commerce Commission has denied intrastate rate increases ranging from 25 per cent upward, which were sought by the railroads in the Chicago switching district. This order is of special significance because only recently the Interstate Commerce Commission held that the railroads' demands were reasonable, and ordered them effective on interstate traffic on or before Nov. 10, 1931.

Coincident with the denial of the rate increases in the Chicago switching district, the State commission also denied the railroads' request to raise the rates from Chicago Heights to the Chicago switching district.

In discussing the interstate situation, the Illinois commission pointed out that 53.3 per cent of the total traffic involved in the case is Illinois intrastate traffic; 6.4 per cent Indiana intrastate traffic, and that the interstate traffic over which the Interstate Commerce Commission has jurisdiction amount only to 40.3 per cent.

The State commission also found that the average distance of one-line hauls in Illinois intrastate traffic is 14.7 miles, while the interstate haul is 15 miles. The average for two-line hauls on Illinois intrastate traffic is 15.9 miles, while the interstate traffic is 27.5 miles. The average three-line haul for Illinois intrastate is 23.4 miles, while the interstate is 34.2 miles.

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American Chemical Society Meets at Buffalo

Papers and addresses heralding fresh advances in all fields of organized chemistry were presented at the opening sessions of the eighty-second meeting of the American Chemical Society at Buffalo on Monday, Aug. 31. The 19 professional divisions of the society are represented by members from 81 local sections.

A symposium on "new research tools" was held on Monday afternoon and Tuesday morning under the chairmanship of Dr. Karl T. Compton, president of Massachusetts Institute of Technology. These new research tools, Dr. Compton pointed out, are fundamentally physical in character and have application to so many other fields that it is difficult for a worker in any one branch to keep in adequate touch with progress in the others.

Among the papers presented during this part of the meeting were: "X-Rays as a Research Tool in Chemistry and Industry," by Prof. George L. Clark, University of Illinois; "New Gages," by Dr. Saul Dushman, General Electric Research Laboratory; "High-Pressure Technique," by Prof. Frederick G. Keyes, Massachusetts Institute of Technology; "High-Temperature Technique," by Dr. Robert B. Sosman, United States Steel Corpn.; and "High-Temperature Control," by Lewis R. Koller, General Electric Research Laboratory.

A public meeting was scheduled for Wednesday evening at which time awards for distinction in chemical science were to be conferred. Among those to receive awards was Frank J. Tone, president of the Carborundum Co., Niagara Falls, N. Y., whose winning of the Jacob F. Schoellkopf medal was announced in THE IRON AGE of Aug. 27.

The technical meetings, which will continue throughout the week, will be interspersed with trips of inspection to several of the large chemical plants in the vicinity of Buffalo.

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Magnesium Metal Prices Again Reduced

Substantially reduced prices on magnesium metal have been announced by the Dow Chemical Co., Midland, Mich. The new prices are 30c. a lb. in carload lots and 32c. a lb. in less than carload lots. The average price for magnesium for 1915, as reported by the Bureau of Mines, was $5 a lb.

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Malleable Castings Orders Off in July

WASHINGTON, Sept. 1.—Orders for malleable castings in July declined to 19,337 net tons from 22,176 tons in June, according to reports received by the Bureau of the Census from 115 establishments. The output was 19,837 tons, or 20 per cent of capacity, against 23,837 tons, or 24.5 per cent of capacity, and shipments were 23,429 tons and 28,132 tons respectively.

In the first seven months of 1931 orders were 205,380 tons, compared with 346,110 tons in the corresponding period of last year. Production was 211,158 tons, or 30.7 per cent of capacity, against 376,531 tons, or 54.5 per cent of capacity. Shipments were 226,816, compared with 376,079 tons.

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Fabricated Steel Plate Orders Up in July

WASHINGTON, Sept. 1.—Orders for fabricated steel plate rose to 27,232 tons in July from 22,806 tons in June, according to reports received by the Bureau of the Census from 51 manufacturers. July orders were distributed as follows: Oil storage tanks, 4136; refinery materials and equipment, 1911; tank cars, 89; gas holders, 2289; blast furnaces, 51; miscellaneous, 18,756 tons.

Orders in the first seven months of 1931 were 189,176 tons, comparing with 301,721 tons in the corresponding period of last year.

Drops Technical Work

Ohio Foundries Association has decided on a change in policy which will convert it into a business organization exclusively. In the past, presentation of papers on technical subjects at its meetings have been part of the activities of the association, but hereafter the association will give no attention to the technical problems of the foundry further than that it will cooperate along these lines with the Gray Iron Institute and other foundry associations.

Under the new plan it is believed that the association will be able to be far more helpful to its members than heretofore. In carrying out its new program the association decided to increase its organization by the addition of a publicity director, and the directors have appointed Edward Salt in that capacity.

A credit and collection department is being organized in the carrying out of the new plan. Considerable attention will be given to traffic and transportation matters and the association will audit freight bills for members and give transportation data on rates and routings. Considerable attention will also be paid to State compensation matters. Efforts will be directed along the line of reducing hazards in order to bring about reduction in premiums. The association will also maintain an employment department for foundry executives.

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Standard 18-8 Rustless Steel Available

The United States Bureau of Standards has prepared a standard sample of 18 Cr—8 Ni steel of the following composition: Carbon 0.060, manganese 0.554, phosphorus 0.010, sulphur 0.012, silicon 0.759, copper 0.056, nickel 8.44, chromium 17.54, vanadium 0.044. This standard is No. 101 in the series and costs $3 per sample of 150 grams. The sample may be paid for in advance with the order or be sent parcel post c.o.d. in the United States and its possessions. All foreign shipments require prepayment, together with 20c. additional postage.

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Structural Work in 1929

WASHINGTON, Sept. 1.—Total sales reported to the Census of Distribution of 1482 plants engaged primarily in making structural and ornamental iron and steel work, not including rolling mills, were $469,502,000 in 1929, of which $371,765,000 worth, or 79.2 per cent, was made to industrials, builders, contractors, building owners, etc. Manufacturing plants sold 3.7 per cent, or $17,631,000 worth, to their own sales branches for resale to dealers and users. The remaining 17.1 per cent, or $80,106,000, was sold to dealers.

Course on Metallurgy to Be Given in Pittsburgh

The Pittsburgh chapter of the American Society for Steel Treating has announced a series of 15 lectures on the basic principles of metallurgy, to be given on Tuesday evenings from Sept. 8 to Dec. 15, inclusive. The course is designed to suit the needs of young men employed in the metallurgical plants in the Pittsburgh district, and especially those who have not had the advantage of a technical education. Professor S. L. Goodale, University of Pittsburgh, is in charge of enrollment for the course. Among those scheduled to deliver the lectures are C. H. Herty, Jr., United States Bureau of Mines; E. G. Hill, Lukens Steel Co.; J. Spotts MacDowell, Harbison Walker Refractories Co.; Professor Goodale; V. N. Krivobok, Carnegie Institute of Technology; Norman Woldman, Westinghouse Electric & Mfg. Co.; N. I. Stotz, Braeburn Steel Corpn.; J. A. Succop, Heppenstall Co.; J. P. Hill, Vanadium Alloy Steel Co.; Dr. James T. Aston, Carnegie Institute of Technology, and R. L. Templin, Aluminum Co. of America.

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"Seal of Quality" for Galvanized Sheets

Galvanized sheets of certified quality, carrying a zinc coating much heavier than on the average commercial sheet, are now available to the consumer through completion of license agreements for the "seal of quality" trademark of the American Zinc Institute.

The manufacturers who have been licensed to use this "seal" upon galvanized sheets are: American Sheet & Tin Plate Co., Pittsburgh; Continental Steel Corpn., Kokomo, Ind.; Reeves Mfg. Co., Dover, Ohio, and Youngstown Sheet & Tube Co., Youngstown.

The matter is under consideration by other manufacturers of galvanized sheets, and a number of them, including Apollo Steel Co., Apollo, Pa.; Bethlehem Steel Co., Bethlehem, Pa.; Granite City Steel Co., Granite City, Ill., and Newport Rolling Mill Co., Newport, Ky., have indicated definitely that they are in sympathy with the movement, formal completion of the license agreement being delayed by absence of some of their officials.

The Zinc Institute seal of quality has been adopted as an emblem for heavily coated galvanized sheets for use as building material, as an aid to the buyer in securing long service and durability. The need of such a guide to quality has been emphasized by recent field investigations of the institute.

In many cases, in rural localities, galvanized roofing sheets originally carrying approximately 1 oz. of zinc per sq. ft. have been found to be rusted in less than five years, while under identical conditions sheets with coatings of approximately 2 oz. per sq. ft. have been found still in good condition after 15 to 25 years of service. Consumers have of course been keenly aware of these differences in service, but, not knowing the cause, have been in a quandary as to how to obtain the more serviceable material. A campaign of education, to explain these facts, and by means of the "seal of quality" to assist the buyer to obtain heavily coated sheets, has therefore been undertaken by the Zinc Institute.

License to use the seal is available to any manufacturer without charge, but all sheets bearing it must conform to the institute's specifications. These were adopted in conference with interested manufacturers, and prescribe a definite standard of 2 oz. of zinc coating per sq. ft.

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Welded Chain Makers to Catalog Simplified Lines

WASHINGTON, Sept. 1.—Designed to assist buyers in maintaining close adherence to the waste elimination program, all of the manufacturers of welded chain who have accepted simplified practice recommendations have expressed their intention to identify the simplified lines in their catalogs and trade lists, according to an announcement by the Division of Simplified Practice, Bureau of Standards. The welded chain industry is the first to record 100 per cent identification in the catalogs of accepter manufacturers.

The division declared that the National Association of Purchasing Agents, the American Institute of Architects, the Associated General Contractors of America, the chief coordinator's office of the Federal Government, and other representative users of simplified commodities have for some time urged that this policy be adopted by manufacturers. It was pointed out that when the simplified items are so identified in trade literature, selection of the simplified items can be made without difficulty, and that often much waste now incurred in checking other files and subsidiary records for this kind of data is eliminated.

According to Alexander B. Galt, acting chief of the Division of Simplified Practice, "there is every indication that manufacturers in other industries, who have cooperated in establishing simplified practice recommendations, will adopt this same policy of identification." He said that "this forward step indicates a realization by producers, distributers and consumers of the value of cooperation in applying self-government to business."

Incentive System of Pay Replacing Daily Wage

Enforced economy, due to prevailing business conditions, is causing many leading industries to abandon the day wage basis for the compensation of labor and to adopt "incentive" systems whereby the laborer is paid only for the amount of work he actually performs, it is reported by Douglas S. Keogh, president, Charles E. Bedaux Co., New York, Inc.

Mr. Keogh states that the "b" unit as a measure for the rate of pay of employees has already been applied to nearly 300,000 workers in industries embracing the manufacture of 276 products ranging from acids, asbestos and automobiles to welding apparatus, wire and woven textiles. In these industries, he said, the transfer from the daily or hourly wage to the "b" unit basis has to date resulted in a saving of $54,000,000 in manufacturing costs, has increased per-man production by 40 per cent, and has added $32,000,000 to the wages paid to labor.

"Abandonment of the day wage basis of compensation is, of course, proceeding most rapidly in the United States," said Mr. Keogh. "We find, however, that the 'b' method of measuring a workman's earnings has been applied in 27 leading plants in Great Britain, 22 in Italy, 15 in Germany, 8 in France, 4 each in Hungary and Holland, 3 in Czechoslovakia, and 1 each in Austria and Belgium.

"The tendency of industry to rationalize its operating costs to the extent of paying a workman according to what he produces is one of the bright spots in the present situation. Eventually the daily wage will be recognized for what it is—an archaic survival of the industrial era which preceded modern mass production methods—and will be eliminated from industry as impractical, inefficient and uneconomical. It is as unfair to the competent worker as it is to the employer."

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Offers Electric Bell-Type Nitriding Furnace

An electric bell-type nitriding furnace has been developed by the Westinghouse Electric & Mfg. Co. Four reasons for the economy and efficiency of this furnace are given as follows:

1. Permanent gas connections are possible because the nitriding boxes are not moved during the entire cycle.
2. Separation of gases is allowed and means of discharging a greater percentage of hydrogen is provided. This leaves a greater concentration of the nitrogen gas and assures uniform and higher quality results.
3. The ventilating fan has been eliminated.
4. As the charge is cooled in the nitriding box, the hot bell is transferred to a second charge. This results in an important economy.

Short-Haul Freight Rates on Iron and Steel to Be Reduced

Railroads Will File Notice With Interstate Commerce Commission—Change May Be Made Soon

WASHINGTON, Sept. 1.—Railroads are about to resume plans to establish low rates on iron and steel products moving distances of not over 100 miles in Central Freight and Trunk Line Association territories. With this end in view it is expected that they will file a modified short notice (sixth section) application in a day or so with the Interstate Commerce Commission to put the proposed scale into effect at an early date rather than to apply them upon the regular statutory notice of 30 days.

The scale to be submitted will be the same as that previously proposed and published in THE IRON AGE of June 18, 1931, page 1997. At that time the railroads asked that the proposed reductions in short-haul rates be put into effect upon one day's notice or not later than July 1.

The commission proceeded, through the form of preparing a so-called fourth section (long-and-short-haul) order, to pave the way for the application of the short-haul rates. The fourth section order, however, was not suitable to the railroads. The upshot was the issuance last week by the commission of a new fourth section order. It is more liberal than the original one, and eliminates the so-called equidistant provision and permits use of the basing point system from points of origin to destination instead of using distances from and to individual non-basing points in complying with the circuity provision.

The proposed scale is the same as that applying in Pennsylvania and, ranging from 3c. for five miles and under to 16c. for 100 miles and over 95 miles, and is less than the scale provided in the general iron and steel rate case, except up to the last block, where the rates are the same.

The proposed and present rates follow:

Miles	Rates in Cents per 100 Lb. Proposed	Present
5 miles and under	3	6
10 miles and over 5	3¾	6½
15 miles and over 10	4½	7
20 miles and over 15	5¼	8
25 miles and over 20	6	8½
30 miles and over 25	6½	9
35 miles and over 30	7¼	9½
40 miles and over 35	8	10
45 miles and over 40	8½	10½
50 miles and over 45	9¼	11
55 miles and over 50	10	11½
60 miles and over 55	10½	12
65 miles and over 60	11¼	12½
70 miles and over 65	12	13
75 miles and over 70	12½	13½
80 miles and over 75	13¼	14
85 miles and over 80	14	14½
90 miles and over 85	14½	15
95 miles and over 90	15¼	15¼
100 miles and over 95	16	16

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Gray Iron Castings Orders Up in July

Orders for gray iron castings increased in July for the first time in three months, according to the monthly report of the Gray Iron Institute. The volume of business in June was 41.1 per cent of normal and in July it was 45 per cent. This increase is believed to have been due to the necessity that industrial companies felt for replenishing their stock of castings to care for a normal increase in business during the early fall months.

Production fell off slightly in July, having been 50.6 per cent of normal, compared with 53 per cent during June and with 63.6 per cent in July last year. The percentage of unfilled orders in July was practically the same as last year—32 per cent of normal, compared with 32.7 per cent a year ago and showing a gain over June, when the percentage of unfilled orders was 28.8 per cent.

Production in the Eastern district, including New York, New Jersey and New England, increased from 45.3 per cent of normal in June to 47.4 per cent in July. There was an increase to 48.7 per cent from 46.9 per cent in Pennsylvania, Michigan, Ohio and the South, east of the Mississippi River, and a decline from 61.4 per cent to 55.6 per cent in July in Wisconsin, Illinois and the territory west of the Mississippi River. In the Chicago district there was a decline from 60.6 per cent in June to 58.5 per cent in July.

Five foundries reported business good, 41 fair, 57 poor and 26 bad, these reports showing very little change from the previous month.

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Fabricated Steel Orders Declined in July

WASHINGTON, Sept. 1.—Actual bookings of fabricated structural steel in July reported to the Bureau of the Census by 231 establishments were 141,241 tons, while the estimated tonnage for all plants was 159,200 tons, or 39.8 per cent of the monthly capacity, which is placed at 400,000 tons. Bookings reported in June by 231 plants aggregated 156,862 tons, while the computed tonnage for all plants was 177,200 tons, or 44.3 per cent of capacity.

Orders reported in the first seven months of 1931 aggregated 1,128,510 tons, against 1,559,570 tons in the corresponding period last year. Estimated bookings in the first seven months of the current year were 1,287,200 tons, or 46 per cent of capacity, compared with 1,768,800 tons or 63.2 per cent of capacity in the first seven months of 1930.

Shipments reported in July of the present year by 225 plants were 130,524 tons, against 116,215 tons reported in June by the some number of but not identical plants. Estimated shipments were 181,600 tons, or 45.4 per cent of capacity, compared with 162,400 tons, or 40.6 per cent of capacity. Shipments reported in the first seven months of 1931 totaled 805,669 tons, against 1,128,510 tons in the corresponding period of last year. Estimated shipments for the two periods were 1,140,000 tons, or 40.7 per cent, and 1,878,800 tons or 67.1 per cent, respectively.

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Small Pea Pack Reduced Tin Plate Consumption

WASHINGTON, Sept. 1.—An explanation of the effect that reduction in the pea crop had on tin plate consumption this year is afforded by figures gathered by the Bureau of Foreign and Domestic Commerce. The production of canned peas in 1931 totaled 13,285,826 cases of 24 No. 2 cans, comparing with 22,035,212 cases in 1930. The figures were gathered at the request of the canning industry and are based on questionnaires returned by canners representing over 96.7 per cent of the total pack.

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1000 Tons of Steel Erected in a Day

What is said to be a record for steel erection was established by erectors of the Phoenix Bridge Co., Phoenixville, Pa., when seven men under Foreman Archamel placed 1000 tons of steel in a day on the 2500-ton bridge in Philadelphia, which is a part of the Pennsylvania Avenue subway improvement being made by the city.

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Wesson Sales Co., Detroit, manufacturers' representative, has changed its name to Wesson Co. It has moved its offices from 7338 Woodward Avenue, Detroit, to 1050 Mount Elliott Avenue, Detroit. J. H. Smith is president of the company. Announcement has also been made that the Wesson Co. has been appointed exclusive Michigan representative of the Butterfield division of the Union Twist Drill Co., Derby Line, Vt., manufacturer of ground and cut taps, dies, reamers and special tools.

Reinforcing Steel

Awards and Pending Projects in Smaller Volume

LETTINGS of reinforcing steel the past week totaled 3700 tons, compared with 3800 tons in the previous week. No award of more than 700 tons was reported. New inquiries will take about 3000 tons. The largest job, 875 tons, is for a school in Philadelphia on which bids are in. Contracts in August amounted to 11,200 tons, the smallest for any month this year. They compare with 24,145 tons in July and 14,300 tons in June. Awards follow:

STATE OF MASSACHUSETTS, 500 tons, State highways; 100 tons to Truscon Steel Co., 400 tons to Concrete Steel Co.

HARTFORD, CONN., 250 tons, warehouse, to Joseph T. Ryerson & Son, Inc.

WESTCHESTER COUNTY PARK COMMISSION, 350 tons, road construction on Cross County Parkway and extension to Bronx River Parkway, to Concrete Steel Co.

WESTCHESTER COUNTY PARK COMMISSION, 100 tons, bridge and overpass at Yorktown, N. Y., to Concrete Steel Co.

JAMESTOWN, N. Y., 100 tons, Erie passenger station, to a local bidder.

FAIRPORT, N. Y., 300 tons, State road, to a local bidder.

CHICAGO, 150 tons, pachyderm house, to Calumet Steel Co.

CHICAGO, 250 tons, Young Women's Christian Association, to Calumet Steel Co.

CHICAGO, 100 tons, electrical building for World's Fair, to an unnamed bidder.

MILWAUKEE, 700 tons deformed bars, harbor improvement work, to American System of Reinforcing.

SAN FRANCISCO, 150 tons, West Portal Public School, to W. S. Wetenhall Co.

MONTEREY COUNTY, CAL., 280 tons, State highway bridge over Bixby Creek, to Soule Steel Co.

LOS ANGELES, 100 tons, theater for West Side Land Co., to Blue Diamond Corpn.

LOS ANGELES, 150 tons, swimming stadium in Exposition Park, to Truscon Steel Co.

GUADALUPE, CAL., 100 tons, memorial building, to Truscon Steel Co.

SANTA ROSA, CAL., 120 tons, S. H. Kress Co. building, to Truscon Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BRENTWOOD, N. Y., 500 tons, State hospital buildings; Brady Concrete Co., low bidder for general contract.

STATE OF NEW JERSEY, unstated tonnage, extension of turnpike, route 10, from Mount Pleasant to Newark.

STATE OF NEW JERSEY, 112 tons, route F-29, section 2, highway from Tanners' Corner to Rue's Lane in Middlesex County.

PHILADELPHIA, 875 tons, junior high school at Fifty-ninth and Malvern Streets; bids in.

WASHINGTON, 2200 tons (reduced from 2500), Federal warehouse; H. R. Blagg Co., Dayton, Ohio, low bidder on general contract.

WASHINGTON, 700 tons, foundations for Interstate Commerce Commission and Department of Labor building; McCloskey & Co., Philadelphia, low bidder.

CHICAGO, 200 tons, Central Groceries warehouse.

CHICAGO, tonnage being estimated, Firestone Tire & Rubber Co.

PHOENIX, ARIZ., 150 tons, sewage disposal plant.

TUCSON, ARIZ., 100 tons, Veterans' Hospital.

LOS ANGELES, 125 tons, store for W. H. Leimert Co.

SACRAMENTO, 100 tons, office building for California Fruit Exchange.

LOS ANGELES, 250 tons, Queen of Angels Hospital.

LOS ANGELES COUNTY, 254 tons, San Gabriel River flood control projects.

UMATILLA COUNTY, ORE., 100 tons, two highway bridges for United States Bureau of Public Roads.

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Committee Is to Define Quality of Wrought Iron

Committee A-2 of the American Society for Testing Materials on wrought iron is undertaking the preparation of a detailed statement and a discussion of what constitutes "quality" in wrought iron. The members of the committee, which is headed by H. W. Faus, engineer of tests, New York Central Lines, will supply information and data on this subject to the subcommittee in charge. There is little or no published information on this subject.

The subcommittee on tubes and pipes has recommended that there be an increase in the permissible variations in weight of double-extra strong pipe in the standard specifications for welded wrought iron pipe (A 72-30). In the present state of the art it is not possible to manufacture furnace-welded pipe of this type within a weight variation of 5 per cent. A variation of 10 per cent will therefore probably be specified as the maximum.

The subcommittee on staybolt and engine-bolt iron has proposed the following definition for double-refined wrought iron:

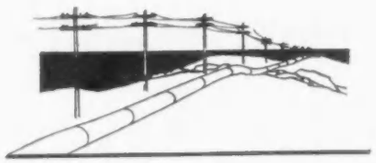
Double-Refined Iron: Iron to be classed as double-refined, shall be all new wrought iron, which shall be first rolled into muck bars. These bars shall then be twice piled and rerolled. All iron shall be free from steel and from foreign scrap. The manufacturer may use his own mill products of at least equal quality but only in the first piling. In the final piling all bars shall be of the full length of the pile.

Committee A-2 has had two specifications which are under its jurisdiction approved as American tentative standards by the American Standards Association. They are:

Standard specifications for refined wrought-iron bars (A 41-30) (A.S.A. No.: G 12-1931); and

Standard specifications for wrought-iron plates (A 42-30) (A.S.A. No.: G 13-1931).

In addition, four other A. S. T. M. standards are being submitted to the A. S. A. for approval as American standards.



Lake Shore Gas Co., Ashtabula, Ohio, F. W. Stone, manager, has authorized construction of a pipe line from Ashtabula to Conneaut, Ohio, to cost about $200,000.

Globe Oil & Refining Co., Blackwell, Okla., is planning a pipe line from Ritz-Canton oilfield district, Kansas, to Blackwell, about 145 miles. Line will be 8-in. from oil field to Wichita, Kan., and 6-in. from that point to terminus at Blackwell. Cost is estimated at $500,000. J. L. Jehle is vice-president and general manager.

Marin Municipal Water District, Mill Valley, Cal., has plans for extensions in pipe lines to cost about $65,000. Hussey & Belcher, Syndicate Building, Oakland, Cal., are engineers.

Continental Construction Co., Professional Building, Kansas City, Mo., affiliated with Natural Gas Co. of America, Chicago, is considering a 30-in. pipe line from natural gas fields in Texas to a point north near Chicago, to augment service of present 24-in. pipe line to Chicago district, completed last spring.

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To Survey Magnetic Properties of Steels

The committee on magnetic analysis of the American Society for Testing Materials will undertake the preparation of a series of critical abstracts of the literature on magnetic analysis. This committee, the chairman of which is A. L. Sanford, chief, magnetic section, National Bureau of Standards, will also shortly begin an experimental survey of the magnetic properties of several series of commercially important steels and will collect such data as can readily be obtained on magnetic test specimens. This information should serve as a valuable foundation for investigations in the field of magnetic analysis.

An important contribution to the knowledge of magnetic analysis was the paper "Relation Between Magnetic Properties, Impact Strength and Hardness" given by Haakon Styri, director of research, S. K. F. Industries, Inc., Philadelphia, at the recent annual meeting of the A. S. T. M. in Chicago. This gave the results of a subcommittee's investigation of this relation. It was brought out that a number of magnetic methods of investigation gave direct correlation with hardness and impact strength and that the latter decreases with increase in hardness. Variation in tempering temperatures in the range investigated have much greater influence on hardness and impact values as well as magnetic properties than changes in quenching temperatures within the investigated ranges.

PERSONALS

HENRY L. FREVERT, heretofore vice-president of the Midvale Co., Nicetown, Philadelphia, has been elected president, to succeed the late Alva C. Dinkey. Dr. Frevert was born in Dayton, Ohio, in 1881. In his last year at Harvard, in 1904, he was appointed Austin teaching fellow in physical chemistry and received the degree of A. B., *magna cum laude*, the following year. He remained as an instructor at Harvard until 1909, when he received his Ph.D. Dr. Frevert then went to the Midvale Steel Co. as chemist and was made chief chemist the following year. Later he became superintendent of the armor plant, then superintendent of the treatment department, and in 1921 he was made general superintendent. When the Midvale Co. was formed in 1923, Dr. Frevert became vice-president, a post he has held continuously until his election to the presidency.

H. L. FREVERT

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CHARLES M. GEARING, division manager of the Meriden plant and member of the board of directors of the New Departure Mfg. Co., Bristol, Conn., has become general works manager, assuming general supervision of production in all three of the company's plants. His association with the New Departure company dates back to 1890. Later he was employed successively by the Waterbury Clock Co., the E. Ingraham Co. and the Dunbar Spring Co. In 1909 he was reemployed by the New Departure company to take charge of the grinding and assembling departments. Four years later he was made division manager of the Elmwood plant and in 1920 went to the Meriden plant to serve in a like capacity.

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J. GUSTAF MOOHL has been appointed sales engineer at Cleveland for the Cincinnati Milling Machine Co. and Cincinnati Grinders, Inc., Sales Co., with headquarters in the Euclid Windsor Building. He has been engaged in design and production of machinery for 24 years, during which period he has been identified with the automotive industry and with the Ingersoll Milling Machine Co., Beaman & Smith Co., and Cleveland Milling Machine Co.

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H. E. CHILCOAT, formerly sales manager of the air dump car department of the Koppel Industrial Car & Equipment Co., Koppel, Pa., has been made general sales manager of the company.

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EDMUND E. BURKE, who for the past eight years has served the Kent-Owens Machine Co. on special sales and engineering work, has been made sales manager, covering both divisions of the company's operations. HAROLD STEVENS has been placed in charge of the newly organized special service department as a means of establishing a closer relationship with the engineering and production divisions of its customers' organizations.

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A. M. JONES, who for the past 33 years has been with the General Electric Co. at Pittsfield, Mass., has retired on pension. He entered the service as a punch hand, being one of the pioneer employees, and rose steadily until at his retirement he occupied the position of one of the most important manufacturing branches of the works, superintendent of the power transformer department.

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HERMAN H. BRIEN, of Racine, Wis., has signed a one-year contract with the Soviet Government to act as superintendent, malleable iron division, Kharkov tractor works in the Ukraine, and is sailing early in September for Russia. He formerly was associated with the Dayton Malleable Iron Co., Dayton, Ohio, and later with the Belle City Malleable Iron Co., Racine.

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J. FRED MEHLHOPE has been appointed Chicago district sales manager of the Newton Steel Co., with offices at 310 South Michigan Avenue.

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HAROLD P. FURLONG, formerly associated with the Belle City Malleable Iron Co., Racine, Wis., has been made Detroit district manager for the Molybdenum Corpn. of America.

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JOSEPH A. CARLIN has become general manager of the Hutto Engineering Co., Inc., Detroit. He was formerly receiver for the company. FRANK J. JESCHKE has been appointed sales engineer, while J. L. NAVIN has been made field engineer for the Cleve-

C. M. GEARING

J. G. MOOHL

H. E. CHILCOAT

E. E. BURKE

land, Pittsburgh, Buffalo, Rochester and Syracuse, N. Y., territories. BEN O. ISOM has returned to the Hutto company as factory representative for Detroit and Chicago territories and WILLIAM F. TOEPFER has been appointed factory representative in Philadelphia, New York and Boston territories. JAMES G. YOUNG will locate in Europe as the company's overseas sales representative.

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ALBERT H. SHONKWILER, assistant superintendent of the Otis Steel Co., Cleveland, resigned Sept. 1 to accept a position with the Steubenville works of the Wheeling Steel Corpn.

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F. C. RYAN, at one time identified with the New Jersey Zinc Co. and later with the Johns-Manville Sales Corpn., has been appointed sales manager of the Newark Wire Cloth Co., Newark, N. J. He is a graduate of Lehigh University in chemical engineering, and during the war was connected with the United States Bureau of Mines.

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CARL COFFEEN, for some years district manager of the American Wire Fabrics Co., Chicago, has become manager of the wire netting department of the Northwestern Barb Wire Co., Sterling, Ill.

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OBITUARY

JOHN F. FIERKE, for 22 years president of the Illinois Iron & Bolt Co., Carpentersville, Ill., died after a lingering illness at his home at West Dundee, Ill., on Aug. 27, aged 71 years. A native of Germany, he came to this country with his family when he was a year old and settled in Dundee. He became associated with the Illinois Iron & Bolt Co. in 1878 as assistant shipping clerk, advancing to office manager, general superintendent in 1898, and two years later manager. In 1905 he was made vice-president and subsequently president.

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EDWARD J. CONDON, president of Condon Engineering Co., Chicago, died recently of a heart attack. He was born at Cambridge, Mass., in 1862 and came to Chicago upon completion of a public school education. He entered the engineering and construction business in 1893 and since 1919 had been president of the company which bears his name.

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JULIUS LEWINSKY, president of the Lewinsky Iron & Metal Co., Milwaukee, died Aug. 17 at his home at Elkhart Lake, Wis. He was 64 years old and was to have celebrated his sixty-fifth birthday in a few days. Mr. Lewinsky was born in Germany, but went to Milwaukee 45 years ago.

Worthington Pump Makes Staff Changes

During the past few weeks a number of changes and additions have been made in the staff of the Worthington Pump & Machinery Corpn., New York. Otto Nonnenbruch, for the past four years chief engineer of the Diesel department of I. P. Morris & De La Vergne, Inc., Philadelphia, has been appointed special sales representative at Buffalo. J. B. Allen, formerly president of the Allen Engineering Co., Bridgeport, Conn., has been made special marine representative, with headquarters at Harrison, N. J. H. G. Wood, heretofore assistant manager of the New England division of the Westinghouse Electric & Mfg. Co., has joined the Worthington company as electrical sales engineer. E. M. Paullin, Jr., has been made electrical sales engineer at the Cincinnati works. John T. Clancy, assistant manager, Buffalo works sales division, has been transferred to the Harrison works. E. W. Hammond, formerly located at Buffalo, has been transferred to Los Angeles as special representative of Diesel and gas engine sales on the Pacific Coast, and A. M. Boehm, also of the Buffalo office, has gone to Kansas City as Diesel and gas engine specialist. Joseph F. Hecking, of the New York office, has been assigned to the Diesel and gas engine sales division at Buffalo. William J. Daly, assistant manager of the Cincinnati works sales division, has been transferred to Pittsburgh, on special sales work, and W. R. Kennedy, of the Pittsburgh office, has been appointed acting district manager at Kansas City. G. A. Herrmann, formerly sales engineer at Chicago, is now acting district manager at St. Paul.

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Pig Iron and Steel Output in Canada Off

TORONTO, Aug. 31.—Production of pig iron in Canada in July amounted to 40,303 gross tons, a decline of 28 per cent from the 55,822 tons reported for the preceding month. In July, 1930, production totaled 64,676 gross tons. For the seven months ended with July, the production of pig iron totaled 339,525 tons, which compares with 515,862 tons for the corresponding period a year ago.

At the end of the month only three furnaces were blowing, situated as follows: Steel Co. of Canada, Hamilton, Ont., one; Algoma Steel Corpn., Sault Ste. Marie, Ont., one, and Canadian Furnace Co., Port Colborne, Ont., one.

Output of ferroalloys in July totaled 3262 tons, compared with 2740 tons in June. The month's output consisted mostly of ferromanganese and silico spiegel along with some ferrosilicon.

July production of steel ingots and direct steel castings reached a new low point for the year to date when it was reported at 45,095 gross tons. This tonnage was 18 per cent under the June level of 55,605 tons and compares with 68,424 tons in July, 1930. For the seven months ended June 30, production of ingots and direct steel castings amounted to 506,974 tons, compared with 705,037 tons in the corresponding period of 1930.

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Import Tariff Suggested for Malay States

WASHINGTON, Sept. 1.—An official memorandum by the High Commissioner of the Federated Malay States reports that it is almost certain that a general import tariff system will be necessary to maintain a stable revenue, says a radiogram from Singapore to the Department of Commerce. American products sold now in the Federated Malay States, duty free, include tin plate, tools, builders' hardware, automobiles and office equipment.

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Concrete Steel Institute to Meet Sept. 28-30

The Concrete Reinforcing Steel Institute will hold its semi-annual meeting at Buckwood Inn., Shawnee-on-Delaware, Pa., Sept. 28 to 30. The first day's program will be featured by an address by the president; an address entitled "Let Us Look Ahead," by Dr. Stephen I. Miller, executive manager, National Association of Credit Men; and a summary of recent promotional activities by the institute engineer. The second day will be devoted to a series of 10-min. talks on conditions in representative cities, with a summary by the president; regional conferences; and a banquet. Reports of the forms department, a proposal for further standardization in areas of spiral rods, and road building developments will be discussed in the final session on Sept. 30.

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New York Factory Pay Lower

Average weekly earnings in representative factories in New York State are reported by the State industrial commissioner at $26.34 for June. This is a drop of 62c. from May and is the lowest for any month since February, 1923, when earnings were on the long up-grade, culminating in the maximum of $30.47 for September, 1929. All employees in both office and shop are included. In June, 1930, the average was $28.96 a week.

Demand Is in Better Relation to Supply

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

STEEL ingot production declined less sharply in July than in June. Our "composite demand" line also declined less sharply in July; unlike its movement in June, it did not fall so rapidly as the production curve. This reduced the maladjustment between production and current requirements of steel consumers, with the result that the spread is now the smallest since December. This suggests some improvement in the stock situation, whether affecting the producer or the consumer, or whether in raw or finished form.

Nevertheless, the composite steel demand curve fell fractionally to a new low for the current depression, and was the lowest since late 1921. The smallness of the decline was a result of conflicting trends in the component items. Small increases occurred in railroad freight tonnage, building contracts, exports and miscellaneous manufacturing.

Automobile production fell more than seasonally, and is almost back to the level of last November. Mining production fell rather sharply to a new low. Machine tool orders slumped, also, and are not much above January. Farm purchasing power continues to decline, as a result of lower farm prices.

In Specific Industries

Railroad traffic may be larger this fall than was anticipated a month ago, because a bumper cotton crop is now forecast. But the prospect of good steel buying by the carriers is still poor. Net railroad income in July was probably more than 30 per cent below last year. Curtailment for maintenance must be practiced as an economy measure.

Freight car orders in July were only about one-third of those in July, 1930, according to *Railway Age*, and only three locomotives were ordered. The surplus of freight cars is more than 100,000 larger than a year ago. No relief has yet come to the railroads in the form of a general rate increase; and, until their buying power improves, steel manufacturers can expect subnormal purchases.

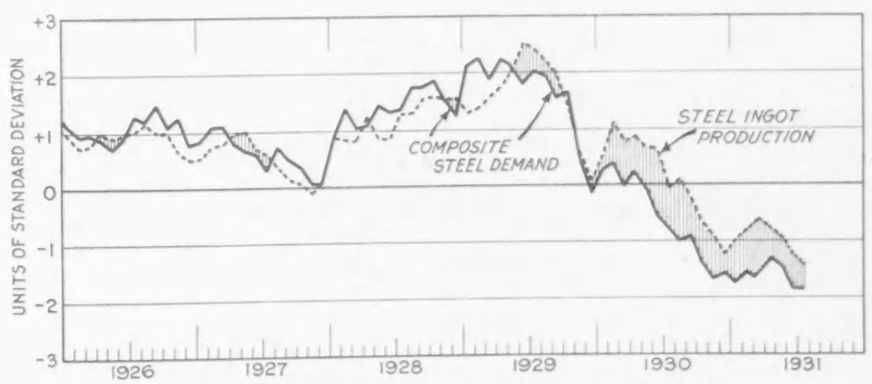
Building activity is at a low level, but improved slightly in July. Permits and construction contracts (floor space) were larger than in June, but contemplated new construction declined. The increase in permits merely cancelled about half of the June drop. Real estate transfers have fallen off; liquidation continues, as numerous bank failures testify.

Automobile production continued to decline during July, and August probably will prove to have been still lower. Shutdowns into September by one of the largest manufacturers will tend to hold down steel specifications from the motor industry as a whole. General Motors sales to users in July were larger than last year, and the total registrations for all vehicles produced by the industry declined less from June than was the case last year, but demand is still poor. New models may call for increased specifications of steel, but what is needed is generally improved purchasing power.

Oil and mining industries are curtailing production more drastically. This action is constructive, but their immediate requirements are reduced and their purchasing power is poor. **Farmers** are probably worse off than a month ago, due to the collapse in cotton prices. Large crops at low prices are more beneficial to the railroad and steel industries than small crops at high prices. Agricultural buying power is most important, however, and that continues to shrink.

Exports improved a little in July. **Miscellaneous general manufacturing** recovered part of its June loss. There is some suggestion, however, that the trend is likely to be downward in some of the individual lines. The decline in machine tool orders, tin plate specifications, wire production, etc., supports this belief.

On the whole, steel demand is still small compared with production, even though the maladjustment is being reduced. Production will probably not decline much in August, but some of the heavily weighted components of the demand curve look lower. Need for some further readjustment is indicated.



REDUCTION in the spread between supply and demand is a hopeful sign. If a balance between them is struck in the autumn, we can look for sustained improvement in business.

Pig Iron Production Goes Still Lower—Net Loss of Six Furnaces

FURTHER losses in output of pig iron in August bring the daily average for the month down to 41,308 tons. This is smaller than the corresponding average made in January, 1900—31 years ago.

Coke pig iron production in the month, gathered almost wholly by telegraph, aggregated 1,280,526 gross tons. This is a decline of more than 12 per cent from the July total of 1,463,220 tons. It makes the smallest total for August since 1921, and the smallest total for any month since October of that year. In August, 1921, the output was only 954,193 tons.

On the daily basis at 41,308 tons, the drop from 47,201 tons of July was almost as great as the corresponding drop between June and July. Compared with 53,732 tons last December, the shrinkage has been about 23 per cent.

In eight months total production amounted to 13,849,119 tons. This shows a drop of almost 9,600,000 tons, or 41 per cent, from the corresponding period of last year. Compared with 1929, the high record year, the shrinkage has been almost 53 per cent.

Net Loss of Six Furnaces

Furnaces in operation Sept. 1 numbered only 76, compared with 82 on Aug. 1. The current figure is the lowest since that of Sept. 1, 1921, when only 70 stacks were in blast. It is precisely the same number as that of July 1, 1921, and compares with 69 on Aug. 1, 1921, the lowest figure in perhaps a half-century.

Estimated rate of operation of the 76 stacks active Sept. 1 is 39,085

Daily Average Production of Coke Pig Iron in the United States by Months—Gross Tons

	1927	1928	1929	1930	1931
Jan.	100,123	92,573	111,044	91,209	55,299
Feb.	105,024	100,004	114,507	101,390	60,950
March	112,366	103,215	119,822	104,715	65,556
April	114,074	106,183	122,087	106,062	67,317
May	109,385	105,931	125,745	104,283	64,325
June	102,988	102,733	123,908	97,804	54,621
½ year	107,351	101,763	119,564	100,891	61,356
July	95,199	99,091	122,100	85,146	47,201
Aug.	95,073	101,180	121,151	81,417	41,308
Sept.	92,498	102,077	116,585	75,890	.....
Oct.	89,810	108,832	115,745	69,831	.....
Nov.	88,279	110,084	106,047	62,237	.....
Dec.	86,960	108,705	91,513	53,732	.....
Year	99,266	103,382	115,851	86,025	.....

Pig Iron Production by Districts, Gross Tons

	August (31 days)	July (31 days)	June (30 days)	May (31 days)
New York and Mass.	112,475	110,089	88,537	105,104
Lehigh Valley	35,969	43,236	46,743	38,745
Schuylkill Valley	17,108	20,676	27,167	27,936
Lower Susq. and Lebanon Valleys	11,226	11,264	8,142	18,956
Pittsburgh district	216,182	273,084	339,018	441,653
Shenango Valley	10,591	14,381	28,543	55,835
Western Pennsylvania	31,174	35,650	32,519	32,430
Maryland, Va. and Ky.	61,551	56,974	66,589	77,218
Wheeling district	125,808	115,662	117,309	119,310
Mahoning Valley	120,156	126,772	151,870	172,703
Central and North'n Ohio	105,221	133,089	133,525	185,095
Southern Ohio	20,725	28,029	22,573	23,885
Illinois and Indiana	233,486	268,139	317,488	405,511
Mich., Minn., Mo., Wis., Colo. and Utah	60,062	66,463	79,608	96,256
Alabama	118,795	159,712	178,996	193,445
Tennessee	.....	.....	.....	.....
Total	1,280,526	1,463,220	1,638,627	1,994,082

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchant Iron*	Total
August, 1930	64,857	16,560	81,417
September	62,342	13,548	75,890
October	57,788	12,043	69,831
November	49,730	12,507	62,237
December	40,952	12,780	53,732
January, 1931	45,883	9,416	55,299
February	49,618	11,332	60,950
March	54,075	11,481	65,556
April	53,878	13,439	67,317
May	51,113	13,212	64,325
June	43,412	11,209	54,621
July	35,789	12,012	47,201
August	31,739	9,569	41,308

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

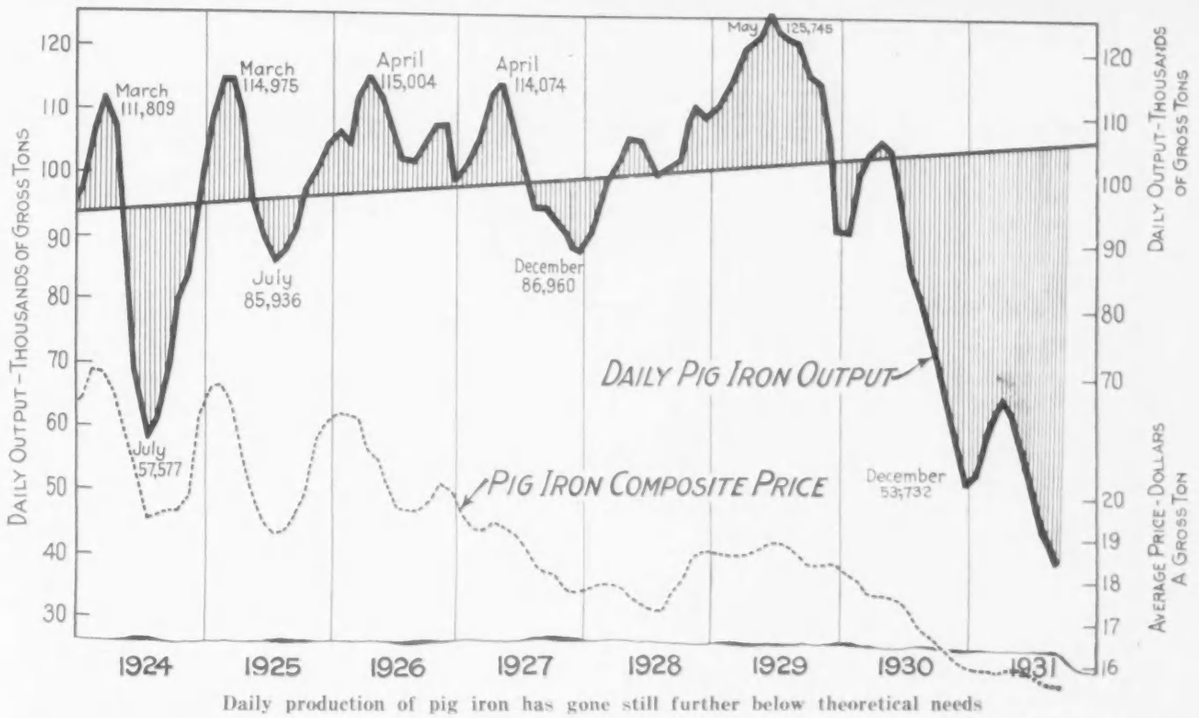
Furnaces	September 1 Number in Blast	September 1 Rate of Operation	August 1 Number in Blast	August 1 Rate of Operation
New York:				
Buffalo	5	3,135	5	2,940
Other New York	1	490	1	465
New Jersey	0	....	0	....
Pennsylvania:				
Lehigh Valley	3	870*	4	1,395*
Schuylkill Valley	1	550	1	495
Susquehanna and Lebanon Valleys	1	360	1	365
Ferromanganese	0	....	0	....
Pittsburgh District	11	6,545	11	7,080
Ferro. and Spiegel.	1	145	1	150
Shenango Valley	0	....	1	465
Western Pennsylvania	1	610	2	1,150
Ferro. and Spiegel.	1	95	0	....
Maryland	2	1,405	3	1,805
Wheeling District	5	3,325	5	3,730
Ohio:				
Mahoning Valley	8	4,005	7	3,695
Central and Northern	7	3,380	9	4,710
Southern	2	670	3	905
Illinois and Indiana	13	7,530	13	8,460
Mich., Wis. and Minn.	3	1,405	3	1,525
Colo., Mo. and Utah	2	855	1	560
The South:				
Virginia	0	....	0	....
Kentucky	1	380	1	265
Alabama	7	3,250	10	5,070
Ferromanganese	1	80	0	....
Tennessee	0	....	0	....
Total	76	39,085	82	45,230

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months—Gross Tons

	1929	1930	1931
January	3,444,370	2,827,464	1,714,266
February	3,206,185	2,838,920	1,706,621
March	3,714,473	3,246,171	2,032,248
April	3,662,625	3,181,868	2,019,529
May	3,898,082	3,232,760	1,994,082
June	3,717,225	2,934,129	1,638,627
½ year	21,640,960	18,261,312	11,105,373
July	3,785,120	2,639,537	1,463,220
August	3,755,689	2,523,921	1,280,526
8 months	29,181,760	23,424,770	13,849,119
September	3,497,564	2,276,770	.....
October	3,588,118	2,164,768	.....
November	3,181,411	1,867,107	.....
December	2,836,916	1,665,690	.....
Year*	42,285,769	31,399,105	.....

*These totals do not include charcoal pig iron. The 1930 production of this iron was 96,580 gross tons.



Daily production of pig iron has gone still further below theoretical needs

Inclined line represents the gradually increasing requirements of the country, ascertained by balancing the ups and downs in production. It shows an average increase in consumption of about 575,000 tons yearly.

gross tons. This shows a drop of more than 6000 tons from the 45,230-ton operating rate a month ago, and is the lowest such figure since that of Oct. 1, 1921, when the rate was figured at 35,650 tons. The average daily rate for the 76 furnaces in operation is 514 tons. This compares with 552 tons a month ago and with 559 tons on July 1.

Some districts held up much better than others, in a comparison between August and July. There was a gain of more than 2 per cent in the New York district, a larger gain in Maryland and Kentucky, and about 9 per cent in the Wheeling district. All the other districts fell off, the sharpest drop having been that of Alabama, where a loss of about 26 per cent was reported. The Chicago district lost 13 per cent and the Pittsburgh district about 17 per cent.

Furnace Changes in August

Six furnaces were blown in in August, seven were blown out, and five were banked, making a net loss of six. Furnaces blown in include two stacks at the Edgar Thomson works of the Carnegie Steel Co. in the Pittsburgh district, stack H at the Cambria plant of the Bethlehem Steel Co. in western Pennsylvania, No. 2 Riverside furnace of the Wheeling Steel Corpn., one Hubbard stack of the Youngstown company in Mahoning Valley, and the Ironton stack in Utah of the Columbia Steel Co.

Furnaces blown out include E stack of the Bethlehem Steel Co. in the Lehigh Valley, one Aliquippa furnace of the Jones & Laughlin Steel Corpn., in the Pittsburgh district, furnace F of the Bethlehem Cambria plant in western Pennsylvania, furnace E at the Bethlehem plant in Sparrows Point, Md., No. 2 Weirton furnace in the Wheeling district, Jisco furnace in southern Ohio and No. 5 Ensley stack in Alabama. Furnaces banked include one Eliza furnace of the Jones & Laughlin Steel Corpn. in Pittsburgh, a Farrell furnace of the Carnegie Steel Co. in the Shenango Valley, No. 3 Ensley stack in Alabama, and two furnaces in northern Ohio, one being the B stack in the Central plant of the American Steel & Wire Co., and the other a United furnace of the Republic Steel Corpn.

Active stacks of the Steel Corporation were reduced by two, two having been blown in, one blown out, and three banked. Independent steel companies blew in three furnaces, banked two and blew out five, making a net loss of four. One merchant furnace was blown in and one blown out.

Seventeen old furnaces long idle have been removed from our list, having been abandoned or dismantled, or scheduled for abandonment, during the past few months. This leaves the list at 290 in place of the 307 (erroneously stated as 308) a month ago. This weeding out process disposes of two furnaces in the Buffalo district, one in the Lehigh Valley, one in Virginia, one in Kentucky, one in southern Ohio, two in Wisconsin, five in Alabama and four in Tennessee.

Production of Steel Companies for Own Use—Gross Tons

	Total Pig Iron Spiegel and Ferromanganese			Ferromanganese*		
	1929	1930	1931	1929	1930	1931
January	2,651,416	2,214,875	1,422,382	28,208	27,260	14,251
February	2,498,901	2,284,234	1,389,304	25,978	21,310	19,480
March	2,959,295	2,600,980	1,676,316	24,978	23,345	27,899
April	2,826,028	2,564,681	1,615,375	22,413	27,777	25,456
May	3,105,404	2,613,628	1,584,511	25,896	30,296	23,959
June	2,999,798	2,304,223	1,302,345	33,363	27,327	11,243
½ year	17,040,842	14,582,621	8,990,233	160,836	157,325	122,288
July	3,039,370	2,075,414	1,091,853	31,040	17,728	17,776
August	3,065,874	2,010,572	983,762	28,461	20,909	12,482
8 months	23,146,086	18,668,607	11,065,848	220,337	195,962	152,546
September	2,862,799	1,870,269	.....	27,595	21,181	.....
October	2,902,960	1,791,421	.....	31,108	24,480	.....
November	2,498,291	1,391,927	.....	31,866	18,619	.....
December	2,112,704	1,269,529	.....	28,564	16,288	.....
Year	33,522,840	25,101,753	.....	339,380	276,530	.....

*Includes output of merchant furnaces.

W. W. MACON
Editor

THE IRON AGE

(ESTABLISHED 1855)

A. I. FINDLEY
Editor Emeritus

Share Cost with Canadian Subscribers

THE Canadian Government has seen fit to impose a duty on business papers as well as on general periodical literature. It amounts to 5c. a copy, or $2.60 per annum in the case of THE IRON AGE. As each Canadian subscription pays $8.50, the tariff brings the cost to a total of $11.10, but THE IRON AGE will absorb $1.10 of this, making the Canadian subscription price now $10.

We can hardly resist observing that the duty on THE IRON AGE is some 30 per cent and, in the case of a weekly that sells for $3 a year, it exceeds 85 per cent. High as it is, it does not get magnified in the public mind as have the United States tariffs, which are neither relatively high nor wide in the scope of application, though the world seems to believe otherwise; the eighteen months of haranguing in the halls of Congress that marked the last tariff legislation are responsible for the exaggerated notions that prevail. Whether Canadian opposition to the higher customs levies will develop remains to be seen.

Remedies That Will Not Cure

RIGHT and left the would-be Daniels continue to bring industry to judgment while they lay down what it should do to cure hard times. Some of them, ignoring entirely the well known causes of this depression, have found satisfaction in arraigning the existing "system," as the American Federation of Labor has done in telling how "owners and managers of industry stand impotent and helpless" before the problem of large-scale unemployment. Others, like the Governor of New York, who calls for "planning—the kind of planning which will prevent and not overstimulate production," find safety in vagueness and carefully avoid anything specific as to the super-planning they have in mind — its personnel, scope, *modus operandi* and machinery of enforcement.

All the arraigners of industry and all the deplorers of the country's lack of a leadership that can show the way out of our distresses seem not to know, though they ought to know, that the control they are now calling for would never be tolerated by the people of the United States. Super-planning that would "prevent and not overstimulate production" would naturally include power to lay its hand on mechanization, even, we may suppose, to the point of suppressing American invention and thus allowing European technicians to commit unhindered the folly of reducing production costs by the use of machines!

Certainly many who have been urging "social planning and social control" in place of the regime of liberty under which our industry and industrial workers have long fared so exceptionally well would be quick to attack any planning and control that involved the hard autocracy of the Soviet system. Yet Sovietism is the logical destination of their proposals. Also we saw last week the General Council of the British Trade Union Congress urging as means of meeting the financial crisis that "measures be taken by the Government in connection with the Bank of England to raise the British level of wholesale prices, either by raising the Bank's price for gold or by other appropriate means." How long would it take the General Council, if wholesale prices were forced up in the way it calls for, to frame another report demanding a decree that no corresponding advance be made in the retail prices of the things wage-earners buy?

Increased consumption is admitted on all hands to be the great desideratum of these troubled times. But it will not come by any such method as this of the British trade unions, or by the proposal of American organized labor for a legislated six-hour day with a five-day week. There is much reason also for distrusting in advance, in view of their source, most of the proposals that are expected to be offered in Congress next winter.

The complicated system we have taken so many years to build up, for the exchange of products and services, has suffered some serious dislocations, largely due to the World War. The process of repair, now under way, is both slow and painful. Those who have had most to do with rearing the structure need not be expected to give much heed to those who would remedy its defects by bombing the foundations.

Railroads Should Take Their Place

SINCE the carriers made their plea to the Interstate Commerce Commission on June 16 for a 15 per cent advance in freight rates, there has been some change in public sentiment on the subject. Many industries at first expected to exert no opposition have presented strong protests. The general appraisal of what the carriers would get and when they would get it has been greatly toned down.

A strong plea was made on the ground of the legal eligibility of railroad bonds for certain investment purposes, in connection with savings banks, life insurance companies and trusteeships. The bonds of many railroad companies would disappear from the eligible list. In the case of New York State, earnings applicable to fixed charges must be one and one-half times the fixed charges in the preceding fiscal year and in four of the five preceding that. If not, no further bonds can be bought. The

State superintendent of banks can use his discretion as to the time allowed for savings banks to liquidate their investments. Trustees would presumably sell at once, as they would be held responsible for market losses after bonds were removed from the legal list.

At the outset the plea made rather a strong impression. It was shocking that the investments of savings banks and life insurance companies, in which so many people are interested, should be impaired, but as time has passed the sense of proportion has led to an alteration of views as to the enormity of the menace. Six million people or more are out of employment, millions more are on part time employment and still more millions have had their incomes reduced. In the stock market decline the public had lost billions of dollars it thought it had. Corporations large and small have had losses, not merely decreases in earnings, and have no idea when they will be able to come back.

It is because the laws governing investments, a portion of which is now at issue, are very stringent that this case has arisen. At the worst, it would probably be a long time before material reductions in dividends on life insurance policies would have to be made. As to savings banks, if well managed, they would have to do no more than reduce their interest rates. There has been widespread complaint about people putting too much money into savings accounts, on the ground that they should either spend it currently or invest it in securities.

It has come to appear that the railroads will have to take their place with the rest of us and make the best they can out of the unfortunate conditions now existing. The situation is not so terrible as it has been painted. Some observers have held that this is the worst depression yet. It is very far from the worst situation the railroads have been in. The more distant past is full of receiverships, failures, reorganizations and great losses by the public. Here is a case merely of railroads not earning as much as one and one-half times their fixed charges. It would be a long way still toward defaults and receiverships or foreclosures. One may well sympathize with the railroads and investors in them, but who is not entitled to sympathy these days?

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WAGE rates per hour in the building trades throughout the United States, notwithstanding the business depression, have continued an almost uninterrupted rise that had its beginning in 1922. At the end of 1930 the composite hourly wage-rate of 15 building trades, in 23 principal cities, was 27.4 per cent higher than it was in 1923, according to the National Industrial Conference Board. The May, 1931, building contract awards were 41 per cent below the 1925-1929 average. Yet May in the five years mentioned averaged 11 per cent above the five-year average. Meanwhile, largely through lower costs of building materials but partly through so-called bootlegging of labor, it has become cheaper to build than it was a year ago and we shall presently begin to do more building. It is unlikely it will be in any such increasing volume as to interfere with the processes that will otherwise bring the building trades more nearly in line with other trades.

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Modernization and Employment

DURING the past six months, THE IRON AGE has placed considerable editorial emphasis upon modernization of industrial equipment as a basic means of reestablishing profit margins and extending employment.

Material values are created through production and production has become largely a matter of mind managing machinery. When a cataclysm of economic and financial maladjustments wipes out a large percentage of our established material values, as has the panic of 1929 and its aftermath, there are two ways to rebuild these values. One is to provide better management; the other is to provide better machinery.

American industry has already performed what might be termed a major operation in management. Our plants are now upon an efficiency basis, from the standpoint of quality of management, that leaves but little slack still to be taken up. Intelligence, in industry, has been stepped up to a performance basis that would have been thought impossible two years ago.

But we have not as yet more than begun to tap the possibilities of value-rebuilding through improved machinery. The reason for this is undoubtedly a reluctance to increase capital expenditures. Management can be improved more cheaply than machinery. But improvement in machinery is practically unlimited, whereas improvement in management is necessarily restricted.

It is encouraging to note indications that the first drastic cutting of overhead which characterized the tuning up of management is now being followed by capital expenditures which will reduce costs through modernization of equipment. For example, the Busch-Sulzer Brothers-Diesel Engine Co. is having built, at a cost of over $100,000, a special large tool that will combine three operations in one set-up.

This tool, partly because it is fitted with a larger electric motor, will probably double the output of the man who runs it; and justify increase in his wages. And the lowered cost will place the company in a position to sell more of its products and hence to employ more labor.

This is modernization. It is an example of the demonstrated doctrine of machinery improvement that built the automobile industry, that has been responsible in large measure for our past prosperity and that is capable of transforming our present idle labor into profitable employed consumers.

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Bewilderment

WHEN we know of millions idle in the United States, in Great Britain, and in Germany, is there no work in each of those countries that might be done? Have each of them sufficient housing, suffi-

cient electrification, sufficient water supply and sufficient means of transportation? Is there not adequate internal credit to finance such operations? Is the failure to make needed domestic improvements ascribable to the high cost of doing them, especially the high cost of labor?

Is the making of public improvements at undeflated rates of wages, perhaps supermarket rates, to provide employment for which taxpayers must stand the bill, a sound economic procedure?

Why do the anthracite coal miners of Pennsylvania lose their market, and consequently their employment, to gas and oil and other competitors? Why do the railways lose the carriage of freight and passengers to steamships, motor vehicles, and pipe lines?

Why are bounteous crops a source of misery to the farmers who raise them and a creator of agrarian discontent? Why is it a bad thing to have ample food and fiber for the nourishment and clothing of the people?

Why should cereals be cheap in the realization of growers in the West and dear in the purchase by poultry and dairy farmers in the East? Why should the mail order houses and chain stores cut their prices for commodities and individual retailers not do so? Why should local coal dealers raise their prices for anthracite in the fall of 1930 while many commodities were falling to pre-war levels?

Considering that our domestic consumption of wheat is about 275 lb. per capita with a diminishing tendency; and considering that we are losing our export trade to other countries that grow it more cheaply, why do our farmers persist in producing an exportable surplus? Is it true that American hygienic authorities are advising our people to eat less starch (wheat) and more vegetables?

Is there not an opportunity for the use of labor discharged from other occupations in the reforestation of neglected lands?

It is the fact that the wheat raisers of western Canada have the same economic complaint as those of the United States? If so, are they the victims of a political policy enacted in Washington, or a financial policy determined by Wall Street, or of a power trust or of Mellonism, whatever those terms may mean?

Why is plenty a grievance in 1931 when famine was the thing most feared in former years?

Why do people leave the country and crowd into the cities? Is there any reason why many people should not feed and clothe themselves and obtain fuel out of the soil by their own work as their forefathers did?

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▲▲▲ CORRESPONDENCE ▲▲▲

Must Maintain Balance of Prices and Costs

To the Editor: It's all in the point of view—on our slant. In an affair as far reaching and complex as is this present depression, it is almost impossible for one individual to obtain a composite picture, and the tendency is to magnify out of proportion those details which lie directly within the line of our vision. It is also difficult to differentiate between cause and effect, and we cannot refrain from emphasizing those phases which have had their greatest effect upon us as individuals.

Consider Mr. Snider's article (Aug. 6) and the comments it brought forth (Aug. 20), and my point is proved. I especially liked Mr. Richards's exposition of the purchasing power of the country, and agree with him that the equation has got out of balance, but must accuse him of confusing an effect for a cause when he attributes the unstability to lower commodity prices.

In any equation the product of the means must equal the product of the extremes. Reduced to its simplest terms, business is simply my trading my product to someone who wants it for something he makes that I want. In the economic equation I am both extremes; I am both producer and consumer. I can participate in consumption only to the extent that I participate in production.

To replace direct exchange or barter, we have invented a medium of exchange—finance. This medium should at all times reflect the value of a commodity in terms of productive effort. That would make for stability. But we have invested it with an importance out of proportion to its true function. We value goods in terms of dollars rather than in terms of productive effort.

Improved production methods have enabled us to increase our output in most lines six, eight or ten times. Tracing all commodities to their source we find that the total of their cost is mostly labor. As we inaugurated improved methods the trend in prices should have been downward, so that balance could have been maintained whereby a producer could exchange an hour of his time and purchase approximately the equivalent of an hour's time of one of his fellows.

I do not advocate limiting production, nor do I suggest that we abandon the search for more economic methods of production. What we must do is to come to a recognition that as we use our brains more we must use physical effort less. The sooner we acknowledge this necessity and make plans to adjust working hours so that all consumers may be employed, the sooner this condition will correct itself and we can begin again our progress right where we left off.

Lower wages, if you will, or raise them, or maintain them at present levels. The effect will be the same provided the price of any commodity does not too greatly exceed the sum total of its cost, and further provided that the work to be done is divided among those to do it. Balance must be maintained.

This should mark the beginning of a new era; of new conceptions on the part of those within whose power it is to direct our destiny. But will it? Society does not give birth to a new idea without a lot of travail. What we are suffering from now are truly labor pains. Conceived in greed, what will the issue be? Unity of Purpose and Commonness of Interest? Or the hideous monstrosity of revolution and Communism?

J. P. Boore,
Pittsburgh Steel Products Co.
Pittsburgh.

Pig Iron Production Declines 12 Per Cent in August

INGOT Output Remains at 31 Per Cent — Construction Work Is Chief Reliance of Industry as Recovery in Automobile Production Fails to Materialize

WITH autumn close at hand, hopes for seasonal recovery in the iron and steel trade are waning. In neither production nor demand are current tendencies of such a character as to point to an impending expansion of activity. Pig iron output in August showed a decline of 12 per cent from July, continuing the recession that began in May. Steel ingot production, unchanged from last week at 31 per cent, remains at close to the lowest rate of the year to date.

Iron and steel specifications, instead of improving, are barely holding their own. Operations in the motor car industry are still on a diminishing scale, and betterment in railroad demand is apparently contingent on the outcome of the freight rate case now before the Interstate Commerce Commission. Action on considerable pending line pipe tonnage has been deferred, and prospects for business in wire products and agricultural machinery are clouded by the abnormally low level of prices for farm products. The extent of possible increases in miscellaneous industrial requirements in iron and steel is still undetermined, since so many "plant vacations" will not terminate until after labor day.

CONSTRUCTION, much of it of a public character, looms up as the chief reliance of the industry for tonnage business. Structural steel awards, at 76,000 tons, are the largest since the middle of July and are made up mainly of Government projects, including a post office in Chicago which alone calls for 48,200 tons. Early action is expected on the steel for other sizable public undertakings, among them a parcel post building in New York, 23,000 tons, for which the general contract has just been placed. Increased pressure on public works programs is now being urged, not merely as a method of alleviating unemployment, but as a possible means of getting industry off of "dead center." Unless this or some other way is found to build up general business activity and restore confidence, iron and steel producers fear that retrenchment policies which began with the reduction of dividends and salaries will have to be extended to include wage cuts.

PIG iron production in August was 1,280,526 tons, or 41,308 tons a day, compared with 1,463,220 tons, or 47,201 tons daily, in July. The daily average was the lowest since October, 1921. Seventy-six furnaces were in blast Sept. 1, or six fewer than one month previous, 12 having been blown out and six lighted. Production in the first eight months of this year, 13,849,119 tons, was 41 per cent smaller than in the corresponding period in 1930.

AUTOMOBILE production, which declined to the lowest rate of the year in August, seems to be headed for a further recession in September. Last month's output of motor vehicles in the United States and Canada is estimated at 175,000 to 180,000 cars, as compared with 223,181 in July, and indications are that the September total will not exceed 160,000. The Chevrolet and Plymouth schedules have been sharply curtailed, and manufacturing operations at the Ford Rouge plant are not likely to get into full swing until late in the month.

New developments in railroad equipment are limited to an inquiry from the Board of Transportation, New York, for 300 to 1500 steel subway cars. Pending shipbuilding work has been augmented by an inquiry from Seatrain, Inc., for two merchant vessels, requiring 12,000 tons of steel, and a request from the Navy for bids on 11 destroyers, calling for a total of 8000 tons.

Prices of scrap, pig iron and finished steel are without important changes. It is true that steel prices have not been subjected to severe tests, but it is also a fact that cost considerations have caused mills to take an increasingly firm attitude on prices. Tin mill black plate, after a period of considerable irregularity in price, now seems to be well established at 2.65c. a lb., Pittsburgh, an advance of $3 a ton over recent quotations.

Machine tool orders placed by the Chevrolet company aggregate more than $500,000. Considerable machinery business is in prospect from other automobile makers who are working on model changes.

THE IRON AGE composite prices are unchanged, pig iron at $15.50 a ton, finished steel at 2.116c. a lb., and steel scrap at $9.08 a ton.

PITTSBURGH

Steel Production Has Not Yet Made the Turn Toward Improvement

▲ ▲ ▲

Not only has September failed to bring improvement in steel production, but Pittsburgh rate is down slightly.

* * *

Steel makers still hopeful of fall betterment, but it may be deferred until fourth quarter.

* * *

Railroads, automobile industry and farm equipment makers do not promise immediate increases in steel orders.

* * *

Scrap market holding its own, with some indications of firmness.

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PITTSBURGH, Sept. 1.—If there has been any change in the rate of steel ingot production in this district it has been down rather than up. Estimates vary with individual companies, but the average of opinion is that the rate is nearer 25 than 30 per cent. One of the Steel Corporation subsidiaries has put on two blast furnaces which had been banked, but an independent steel maker has banked two blast furnaces in the past week. A Pittsburgh district sheet maker is planning to start up three or four open-hearth units, but against that development is the fact that some of the other producers find themselves rather heavily stocked with steel in semi-finished form, and are inclined to curtail new production in an effort to reduce banked stocks.

August showed some gain in demand for strip steel, but in most other finished products, with the exception possibly of line pipe, the month was a rather lean one, and in wire products was described as being the worst since the 1921 depression.

Steel makers still are hopeful that the long expected return in business will develop in the final quarter of the year, but the expectation remains more of a hope than a definite prospect.

Improvement in railroad demand is definitely tied up with the plea of the carriers for higher freight rates, and lately there has been an increasing belief that the decision of the Interstate Commerce Commission will be adverse, despite the fact that when the request was first made there was a very strong sentiment in favor of the granting of the increase.

While some gain is expected in the purchases of steel for automobiles in the next 60 or 90 days, few are so optimistic as to believe that the takings will be much more than the requirements for making up cars for exhibition and dealers' stock. The outlook for structural steel, taking the country at large, is reasonably good, but the hopes concerning purchases by the makers of agricultural implements are dampened by the continued low prices for almost all farm products.

PIG IRON

Demand for pig iron still is confined largely to single carloads, placed as the need arises. While the inquiry for steel castings has improved materially in the past 30 days, the gain is slow in crystallizing into actual orders and, from the standpoint of melt, the foundries are no busier than they have been. Average steel foundry operation in the district is approximately 25 per cent of capacity. Iron foundries are doing little, if any, better. Production of merchant pig iron, although the lightest in a long time, is believed to be in excess of current shipments. The number of active blast furnaces in this and nearby districts is the same as a week ago, the banking of two furnaces by one steel company having been offset by the starting up of two stacks which had been banked by another steel maker. Pig iron prices are unchanged, but nominal.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$15.50 to $16.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$16.00 to $16.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

SEMI-FINISHED STEEL

In keeping with the low rate of engagement of finishing mills, both shipments on contracts and fresh demands are limited. It is noticeable, however, that on such demands as are developing there is usually insistence on prompt shipment, indicating that stocks in the hands of non-integrated manufacturers are light. There is no change in quotations. Buyers are not pressing for concessions and producers do not think that lower prices would materially help the demand. Wire rods are dull. One important outlet is the makers of cold-headed bolts, going principally to the automobile builders, and there is very little demand from that direction at present.

RAILS AND TRACK SUPPLIES

Except for some unexpected releases against some old orders for track fastenings, business is not materially better than it has been for some time. Rail and track supply business over the remainder of this year is rather closely tied up with the plea of the railroads for higher freight rates, and there is no very clear idea as to the attitude of the Interstate Commerce Commission. Sentiment seems to have changed as to the possibility of a freight rate increase, and there is an increasing belief that relief for the railroads will come through wage reductions rather than through rate increases.

BARS, PLATES AND SHAPES

Leading producers in this district do not find current orders or prospects an occasion for much real optimism. The most encouraging feature is that prices of bars, plates and shapes are holding rather well, although it is admitted that they are not being very seriously tested. The other phase, however, is that producers realize that concessions will not bring out orders that would not come out anyway and are not trying to stimulate business by shading prices. The really large structural projects, now as in times of activity, are treated as individual items in the matter of price. Railroad buying in the heavy hot-rolled products is light, although there may be a fair tonnage in 500 freight cars which the New York Central is planning to build in its own shops. It is possible, however, that the fresh purchases of steel against this requirement will be somewhat minimized by the fact that the road will use stocks at its various shops. In concrete bars the situation is reasonably satisfactory as to shipments, but very unsatisfactory from the price standpoint. Structural steel lettings in this area have been few and small.

COLD FINISHED STEEL BARS

This line presents the unusual condition of light demand, but firmly maintained prices. There is no pressure on the part of consumers for concessions, and among producers there is a general attitude that business would not be helped by a price cut. Production is running about 25 per cent of capacity.

WIRE PRODUCTS

Demand from both manufacturing and jobbing sources remains very

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Sept.1, 1931	Aug.25, 1931	Aug.4, 1931	Sept.2, 1930
No. 2 fdy., Philadelphia	$16.76	$16.76	$17.01	$19.76
No. 2, Valley furnace	17.00	17.00	17.00	18.00
No. 2 Southern, Cin'ti	14.69	14.69	14.69	15.69
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.50	17.50	17.50	17.50
Basic, del'd eastern Pa.	16.75	16.75	16.75	18.75
Basic, Valley furnace	15.50	15.50	15.50	18.00
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	20.26
Malleable, Chicago*	17.50	17.50	17.50	17.50
Malleable, Valley	17.00	17.00	17.00	18.50
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seab'd carlots	†85.00	†85.00	†85.00	94.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Ferromanganese quotations adjusted to carload unit; larger quantities at discounts.

Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh	29.00	29.00	29.00	31.00
Slabs, Pittsburgh	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.70

Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.75
Bars, Cleveland	1.65	1.65	1.65	1.70
Bars, New York	1.93	1.93	1.93	1.93
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.75
Tank plates, New York	1.88	1.88	1.88	1.88
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.75
Structural shapes, New York	1.85½	1.85½	1.85½	1.80½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.55	1.55	1.55	1.65
Cold-rolled strips, Pittsburgh	2.15	2.15	2.15	2.35

Finished Steel, *Per Lb. to Large Buyers:*	Sept.1, 1931 Cents	Aug.25, 1931 Cents	Aug.4, 1931 Cents	Sept.2, 1930 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	2.90	2.90	2.90	3.00
Sheets, galv., No. 24, Chicago dist. mill	3.00	3.00	3.00	3.10
Hot-rolled sheets, No. 10, Pittsburgh	1.70	1.70	1.70	
Hot-rolled sheets, No. 10, Chicago dist. mill	1.80	1.80	1.80	
Wire nails, Pittsburgh	1.90	1.90	1.80	2.00
Wire nails, Chicago dist. mill	1.95	1.95	1.85	2.10
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., P'gh	2.55	2.55	2.55	2.70
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.85
Tin plate, 100-lb. box, P'gh	$5.00	$5.00	$5.00	$5.25

Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$10.50	$10.50	$10.75	$15.50
Heavy melting steel, Phila.	8.50	8.50	8.75	13.00
Heavy melting steel, Chicago	8.25	8.25	8.75	12.50
Carwheels, Chicago	9.50	9.50	10.00	13.50
Carwheels, Philadelphia	12.00	12.00	12.00	15.00
No. 1 cast, Pittsburgh	11.00	11.00	11.00	13.50
No. 1 cast, Philadelphia	11.50	11.50	11.50	13.00
No. 1 cast, Ch'go (net ton)	8.50	9.00	9.00	12.00
No. 1 RR. wrot., Phila.	10.00	10.00	10.00	15.00
No. 1 RR. wrot., Ch'go (net)	7.00	7.00	7.00	10.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.40	$2.40	$2.40	$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	7.87½	7.87½	8.12½	11.12½
Electrolytic copper, refinery	7.25	7.25	7.50	10.50
Tin (Straits), New York	**26.75**	26.35	24.80	29.75
Zinc, East St. Louis	3.80	3.80	3.85	4.35
Zinc, New York	4.15	4.15	4.20	4.70
Lead, St. Louis	4.22½	4.22½	4.22½	5.35
Lead, New York	4.40	4.40	4.40	5.50
Antimony (Asiatic), N. Y.	6.60	6.60	6.65	7.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

light, and some producers find that the business for August was the smallest in any corresponding month since 1921. There seems to be some irregularity in secondary markets, but mill prices are holding with remarkable firmness, since producers recognize the futility of trying to help sales by price concessions.

TIN PLATE

Tin mill operations still are holding right around 50 per cent of capacity, and, while the prospect is that there will be a further recession before there is any material upturn in mill engagement, it is observed that tin plate once more in a period of depression has been an exception to the general tendency of steel products. Tin plate has lost a little more ground than it did in 1921, but in that year there was no such drastic regulation of packing operations as there has been this year. The pack of peas has been sharply curtailed and the California peach pack will be reduced by the uprooting of 80,000 acres of peach orchards.

STRIP STEEL

Business with some makers has shown a substantial betterment in August as compared with July, but the significance of the improvement wanes when it is recalled that business was very slack in July. Prices are well maintained. Most manufacturers have opened books for fourth quarter business at unchanged prices. Although by no means general as yet, some makers are quoting an advance on cold-rolled strips in small lots, naming 2.25c., base, against 2.15c. for sizable tonnage.

SHEETS

Makers are disposed to emphasize the firmness of the market rather than its activity, which is expressed in sheet mill operations averaging about one-third of theoretical capacity. Prices are not being heavily tested, but producers show less disposition to seek business at the expense of prices than at any other time in the history of the industry. There never was a time when there was 100 per cent adherence to the schedules, but it is said that observance of quotations now is nearer that mark than ever before. Users of sheets, with few exceptions, seem to be going along with very moderate stocks, and when a recovery in business sets in demand for sheets is likely to increase rather sharply.

After a period of uncertainty and irregularity in the prices of tin mill black plate, the market finally has become quotable at 2.65c., base Pittsburgh, for No. 28 gage, an advance of $2 a ton over recent sale prices.

TUBULAR GOODS

Excepting line pipe, the volume of business in tubular products did not vary much in August from that of July and June. The latest word on

THE IRON AGE COMPOSITE PRICES

	Finished Steel	Pig Iron	Steel Scrap
Sept. 1, 1931	2.116c. a Lb.	$15.50 a Gross Ton	$9.08 a Gross Ton
One week ago	2.116c.	15.50	9.08
One month ago	2.116c.	15.54	9.42
One year ago	2.142c.	16.88	13.67
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1931	2.142c., Jan. 13	2.102c., June 2	$15.90, Jan. 6	$15.50, Aug. 11	$11.33, Jan. 6	$9.08, June 23
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

the Stanolind line is that it has been deferred for the present. It is early for much demand for standard pipe for fall heating requirements, and automotive industry demands are small in keeping with the low production rate and uncertainty as to output in the next month or two. The rise in the price of crude oil in the Southwest, coupled with the fact that the application of the proration plan will result in some increase immediately in the production of oil, is expected to bring about some increase in the demand for well casing. The price situation in tubular goods is reasonably firm.

COAL AND COKE

Prices are holding where they have been in recent weeks. Fair demand is reported for foundry coke, and the foundries also are a little more free in taking heating coke, which sells at $2 to $2.25 a net ton at ovens. Furnace coke is very dull. Pending improvement in general industrial activity and railroad operations, a limited production of coal is proving more than ample.

OLD MATERIAL

The market is somewhat firmer and higher on compressed sheet scrap, and a rise of 50c. a ton has been established by sales of low phosphorus sheet bar crops. On other grades prices are much where they were last week and, while the market has not shown much activity, there have been a few sales of heavy melting grade at prices that fully confirm last week's range. One of the Steel Corporation's subsidiaries is credited with purchases of approximately 10,000 tons of heavy melting steel, mostly at $10.50. An independent steel company, preparatory to starting up some additional steel-making capacity, has been buying heavy melting steel and sheet scrap.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$10.25 to $10.75
No. 2 heavy melting steel	9.50 to 10.00
Scrap rails	10.25 to 10.75
Compressed sheet steel	10.25 to 10.75
Bundled sheets, sides and ends	9.50 to 10.00
Cast iron carwheels	10.50 to 11.00
Sheet bar crops, ordinary	11.00 to 11.50
Heavy breakable cast	8.00 to 8.50
No. 2 railroad wrought	10.25 to 10.75
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	12.75 to 13.25
Railr. coil and leaf springs	12.75 to 13.25
Rolled steel wheels	12.75 to 13.25
Low phos. billet and bloom ends	14.50 to 15.00
Low phos. mill plates	12.50 to 13.00
Low phos. light grades	12.50 to 13.00
Low phos. sheet bar crops	13.50 to 14.00
Heavy steel axle turnings	9.50 to 10.00
Electric Furnace Grades:	
Low phos. punchings	13.50 to 14.00
Heavy steel axle turnings	9.50 to 10.00
Blast Furnace Grades:	
Short shoveling steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Rolling Mill Grades:	
Steel car axles	16.50 to 17.50
Cupola Grades:	
No. 1 cast	10.50 to 11.50
Rails 3 ft. and under	12.50 to 13.00

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.10c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.05c.
Galv. sheets (No. 24), 25 or more bundles	3.40c.
Hot-rolled sheets (No. 10)	3.15c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Bolts	3.60c.
Track bolts, all sizes, per 100 count,	70 and 10 per cent off list
Machine bolts, 100 count,	70 and 10 per cent off list
Carriage bolts, 100 count,	70 and 10 per cent off list
Nuts, all styles, 100 count,	70 and 10 per cent off list
Large rivets, base per 100 lb.	$3.20
Wire, black, soft ann'l'd, base per 100 lb.	2.30
Wire, galv. soft, base per 100 lb.	2.75
Common wire nails, per keg	2.05
Cement coated nails, per keg	2.05

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

Cut Nails, Wire Tacks Group Adopts Rules

Following changes suggested in their trade practice conference rules by the Federal Trade Commission, members of the industry devoted to making and selling cut and wire tacks, cut nails and staples, have accepted the rules as acted on.

The commission approved seven rules, designating them Group I. They refer to such practices as secret payment of rebates; discrimination in price between different purchasers of commodities; false marking of products; selling by false means or devices; selling goods below cost with the intent and effect of injuring a competitor; false advertising of grade, quality or quantity; and imitation of trade marks, trade names or slogans.

In a second group the commission placed four rules and accepted them as expressions of the trade. They refer to such subjects as false invoicing, arbitration, minimum standards of construction, and a committee on trade practices.

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Rapid development of cold-finished bars within the last few years has confused many manufacturers in the selection of steel for their requirements. As an aid in overcoming this difficulty, Joseph T. Ryerson & Son, Inc., Chicago, has issued a bulletin describing the wide variety of shafting, screw stock, and open-hearth case carburizing steels in use today. Everything from standard shafting to special accuracy stock is explained in a non-technical manner, describing what each is used for and why it serves certain purposes to the best advantage.

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"Sillimanite Minerals as Refractories" by Frank H. Riddle is the title of a pamphlet offered by the Electrochemical Society as a reprint from its *Transactions*.

CHICAGO

Signs of Fall Upturn in Business Are Still Lacking

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Demand for steel fails to reflect anticipated fall improvement.

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Spurt in orders in previous week not continued during the past week.

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High spot of market is placing of contract for 48,200 tons of structural steel for Chicago Post Office.

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No increase in automobile tonnage; railroad buying negligible.

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Scrap is still marking time.

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CHICAGO, Sept. 1.—The limited gains in finished steel specifications reported in the previous week failed to carry through the final days of the month. In fact, tonnage coming to Chicago district mills fell off in the case of some products, notably rails and tank plates. Offsetting the unfavorable developments to some extent has been the placing of heavy contracts for structural steel and sheet steel piling. The Chicago Post Office, requiring 48,200 tons of structural shapes, has been let to the American Bridge Co., while four Milwaukee fabricators have taken 7000 tons for a bridge in that city. Harbor improvement at Milwaukee has also taken 8000 tons of sheet steel piling, and reinforcing bar lettings have been satisfactorily heavy.

The general run of manufacturing consumers of steel products are taking steel at about the rate which has prevailed for the last several weeks. Recent releases, even though slightly under those of the previous week, have not fallen under the average of the last month. No change in the status of the agricultural implement industry is reported, and conflicting opinions are held in the trade. While some plants will undoubtedly increase their operations during October, one large interest contemplates little change in activity before December and another sees no change over the remainder of the year. The prospect of some sizable Russian orders in the next month may alter the situation considerably. Chicago district mills are encountering no increase in their automobile tonnage and railroad buying is negligible. Rail releases during the week amounted to less than 3000 tons. Car builders and railroad shops are taking little material. No important fourth quarter inquiry for any product has made its appearance as yet, although some sheet consumers are beginning to sound out the market.

Pig iron and steel ingot production show little change. Nine of the available steel works blast furnaces in the district are active, and open-hearth capacity is engaged at slightly over 30 per cent, a figure which has prevailed for several weeks. Rail production stands at about 20 per cent and sheet mills are 30 to 35 per cent active. Tin mills are making the best showing, with an average of about 55 per cent of capacity, and shipments to the container manufacturers are in good volume.

PIG IRON

Buying of pig iron by local foundries is at low ebb, and shipments during August barely exceeded the July total. Forward inquiry is almost entirely lacking, although the feeling in the trade is somewhat better. A few users are beginning to sound out the market. Prices are holding reasonably well in the immediate Chicago district, although competition is keen in outlying territory. The price of 8 per cent silvery iron is very weak, and sharp concessions have made the market quotable at $1 a ton under recent levels.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos. sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

BOLTS, NUTS AND RIVETS

Releases during August were at the lowest level of the summer, but some consumers indicate a limited increase in their needs this month. Structural fabricators constitute the best outlet for rivets. Prices on bolts and nuts are still subject to shading on spot business, but makers are unwilling to make fourth quarter contracts at less than the full prices.

CAST IRON PIPE

The market continues fairly active, but the tonnages involved are not large. A number of projects are being contemplated, including a filtration plant at Fort Wayne, Ind., which will probably involve sizable tonnages. Prices for pipe 6 in. and larger are well maintained at a range of $33 to $35 a ton, Birmingham, or $41 to $43, delivered Chicago.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $41 to $43; 4-in., $41 to $46; Class A and gas pipe, $2 extra.

SHEETS

No change in demand for sheet steel products can be noticed in this district. Orders are generally for small lots. Many consumers who stocked up rather heavily during July at the old prices will not be in the market until late this month. A little inquiry for fourth quarter has appeared, but mills are delaying quotations as long as possible. Shipments to implement manufacturers are at a minimum; machines such as combines, which require large sheet tonnages, are well stocked by manufacturers. Culvert stock is still in fair demand. The Wisconsin State Board of Control has ordered 400 tons of sheets from the Inland Steel Co. for 1932 license plates. Mill operations have not changed and are being maintained at 30 to 35 per cent of capacity. The leading interest is running at a slightly higher rate. Prices are well held, although it is admitted that the present market is offering no adequate test.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.40c. to 2.50c.; No. 24 galv., 2.95c. to 3.05c.; No. 10 blue ann'l'd, 2.00c. to 2.10c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

WIRE PRODUCTS

While demand from jobbers has broadened slightly in the last week, manufacturers' wire shows little change and aggregate movement is at the lowest level of the year. Merchant wire products in small and mixed carload lots are distinctly better from the standpoint of number of orders, but the tonnage involved is insignificant. Most of the important outlets for manufacturers' wire are dormant, and the same might be said for copper cable. Prices are well maintained, with manufacturers' wire quoted at 2.25c., Chicago district mill, and nails at $1.95 a keg.

RAILS AND TRACK SUPPLIES

Following two weeks of expansion, releases for rails have barely held their own in the last few days, having amounted to less than 3000 tons since last reported. However, there is a fair prospect of added tonnage during the month, and mills in the district will be able to maintain the present rate of about 20 per cent of capacity. Demand for accessories is somewhat more regular, specifications

during the last week having been fully equal to the recent average. New business is light in both rails and accessories and no additional inquiry has come out. The Inland Steel Co. has taken 1454 tons of standard-section rails for the Cincinnati Union Terminal. The remainder of the tonnage placed went to the United States Steel Corpn. and probably will be rolled by the Pittsburgh district mill. Rail joints for the project will be furnished by a Chicago maker, but the other accessories went to mills further east.

WAREHOUSE BUSINESS

While sales out of Chicago steel warehouses continue to show improvement, reflecting a gain for the fourth consecutive week, business in outlying territory served by Chicago has been quiet. Orders are generally for small lots, but are well diversified so far as products are concerned. No changes in prices are reported.

BARS

Movement of mild steel bars during August was about equal to that of July, which, in view of a usual seasonal improvement in the month just past, made a rather discouraging record. Activity on the part of the principal manufacturing consumers in the Chicago district is still at low ebb, and there is no certainty of market improvement after Labor Day. One of the leading agricultural implement makers does not expect to increase operations very much before December and another plans no further activity this year. Alloy steel bars are also very dull, demand being particularly influenced by the low rate of activity on the part of automobile makers. The price of merchant bars is holding at 1.70c., Chicago. Rail steel bars to the manufacturing trade are well maintained at 1.60c., Chicago Heights mill. Demand is holding its recent gains and is sufficient to support mill operations at 40 to 45 per cent of capacity. No signs of improved demand from the barn equipment industry are reported and bed manufacturers have not increased their requirements.

PLATES

With the exception of the steady movement of skelp to the Milwaukee pipe fabricator, conditions in the steel plate industry are still rather unfavorable. Demand from railroad car builders is light, and little new inquiry is coming out. The Chesapeake & Ohio is inquiring for 1000 tons for repair work. Otherwise, repair work in railroad shops is insignificant. Tankage work is also at a low ebb, orders during the week having amounted to scarcely 1000 tons. The oil industry is naturally awaiting the results of proration measures in the mid-continent fields, but the prospect of this consuming channel taking much plate tonnage in the next few weeks is not good. The plate price is fairly well maintained at 1.70c., Chicago district mill.

REINFORCING BARS

Awards continue light for this time of year, with the preponderance of contracts in lots of 20 tons each and smaller. Billet steel bars for buildings are sinking to a level around 1.55c. a lb. and rail steel bars used for the same purpose can be had at 1.25c. a lb. Tests are lacking on prices for rail steel bars for road slab and bridge work, but weakness is detected. Shipments for this purpose are very much lighter because old contracts are completed and new work is held in check while a dispute rages between union officers and Illinois State officials.

Early action is expected on the bars for the Chicago Post Office, amounting to 5000 tons instead of 2000, as originally estimated.

STRUCTURAL MATERIAL

The American Bridge Co. has been awarded the structural steel for the Chicago Post Office, amounting to 48,200 tons. Four Milwaukee fabricators have also divided 7000 tons of steel for a viaduct at Milwaukee. The steel will be rolled by the Inland Steel Co. The latter company has also taken 1600 tons of steel piling for harbor improvement at Milwaukee. A number of other sizable structural tonnages are still before the trade, although new inquiry is confined largely to bridge and post office work. The Foundation Co., New York, has taken the general contract for two highway bridges in Louisiana, requiring about 8000 tons. Fabricating shops in the district are engaged at about 35 per cent of capacity, but work is somewhat irregular because of the lack of small jobs. Structural shapes are still quoted at 1.70c., Chicago district mill, but this figure is occasionally shaded on desirable tonnages.

OLD MATERIAL

A few sales of No. 1 heavy melting steel have been made in the last week at $8.50 a gross ton, and the market is well defined at $8 to $8.50. Consumers are not taking material in any larger quantities, however, as no significant gain in ingot operations has occurred. However, some users are less particular about the number of cars that will be accepted daily from any one dealer than they were a few weeks ago. Blast furnace scrap continues to be rather scarce and much of the available material is being purchased for boat shipment to Lake Erie points of consumption. As a result the price is slightly stronger. Although there has been talk of shipping heavy melting steel to Lake Erie by boat, activity along this line has not been noticed in the Chicago market. The foundry grades of scrap are very quiet, and prices on machinery and railroad cast are weaker. Prices on the other grades are nominal in the absence of important trading. Railroad lists are very light. As an example, the Chicago & North Western is offering only 1200 tons this month, compared with its usual 4000 to 5000 tons.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel, 1.55c. to	2.00c.
Rail steel reinforcement—	
For buildings	1.25c. to 1.55c.
Highway slabs	1.50c.
For bridges and culverts	1.65c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, 7/8 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (7/8 in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Coach and lag screws	70
Hot-pressed nuts, sq., tap. or blank.	70
Hot-pressed nuts, hex., tap. or blank.	70
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

Prices del'd Chicago dist. consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$8.00 to	$8.50
Shoveling steel	8.00 to	8.50
Frogs, switches and guards, cut apart, and misc. rails	8.00 to	8.50
Factory hyd. comp. sheets	6.50 to	7.00
Drop forge flashings	6.00 to	6.50
No. 1 busheling	6.00 to	6.50
Forg'd cast and r'l'd steel carwheels	8.50 to	9.50
Railroad tires, charg. box size	10.50 to	11.00
Railroad leaf springs cut apart	10.25 to	10.75
Axle turnings	6.75 to	7.25
Acid Open-Hearth Grades:		
Steel couplers and knuckles	9.00 to	9.50
Coil springs	10.50 to	11.00
Electric Furnace Grades:		
Axle turnings	7.25 to	7.75
Low phos. punchings	11.00 to	11.50
Low phos. plates, 12 in. and under	10.50 to	11.00
Blast Furnace Grades:		
Cast iron borings	4.25 to	4.75
Short shoveling turnings	4.25 to	4.75
Machine shop turnings	4.25 to	4.75
Rolling Mill Grades:		
Rerolling rails	10.00 to	10.50
Cupola Grades:		
Steel rails, less than 3 ft.	10.25 to	10.75
Steel rails, less than 2 ft.	11.00 to	11.50
Angle bars, steel	9.25 to	9.75
Cast iron carwheels	9.50 to	10.00
Malleable Grades:		
Railroad	7.50 to	8.00
Agricultural	7.50 to	8.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	19.00 to	21.00
*Relaying rails, 65 lb. and heavier	22.00 to	27.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	8.50 to	9.00
Iron arch bars and transoms	9.00 to	9.50
Iron car axles	15.50 to	16.50
Steel car axles	12.00 to	12.50
No. 1 railroad wrought	7.00 to	7.50
No. 2 railroad wrought	7.00 to	7.50
No. 1 busheling	5.50 to	6.00
No. 2 busheling	4.00 to	4.50
Locomotive tires, smooth	11.50 to	12.50
Pipes and flues	5.50 to	6.00
Cupola Grades:		
No. 1 machinery cast	8.50 to	9.00
No. 1 railroad cast	7.00 to	7.50
No. 1 agricultural cast	7.00 to	7.50
Stove plate	6.25 to	6.75
Grate bars	5.50 to	6.00
Brake shoes	5.75 to	6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

CLEVELAND

Improvement in Steel Business Is Slight and Spotty

CLEVELAND, Sept. 1.—Demand for finished steel gained a little in spots during the past week. However, there is as yet little indication of any permanent improvement this month over August. Increase in business during the week was almost wholly in orders from the motor car industry in the Michigan territory. One maker of low-priced cars purchased some steel, largely in strip material, and some business in sheets is pending from another automobile company. Both car builders are buying steel to wind up production on present models, which are to be replaced shortly. This fill-in business is all for prompt delivery.

From other consumers, mostly in the automotive field, there was a gain in small-lot orders for steel bars, and this enabled a local mill to put on an additional open-hearth furnace this week. With no change in operations by other local plants, Cleveland mills this week are operating 10 open-hearth furnaces, or at 29 per cent of capacity, a gain of three points over last week.

With production of some of the automobile companies tapering off and with others apparently arranging no definite production schedules for the fall, demand for steel from the motor car industry this month is expected to show little change as compared with August. It is too early to determine to what extent other metal-working industries will get under way this month, as many of the plants that have been shut down will not resume operations until after Labor Day. However, better operations are looked for, which should be reflected in some increase in the demand for steel.

PIG IRON

Sales gained somewhat the past week, during which one producer booked 5000 tons, all in small lots, for early requirements. Shipping orders continue to come out a little better, largely from foundries making automobile castings in the Michigan territory and from manufacturers of heating equipment. There is very little new demand in this immediate territory. Operations by Ohio jobbing foundries continue very light. Operations by steel foundries in Ohio are at 18 per cent of capacity. Producers look for a moderate gain in shipments this month. Foundry and malleable iron prices are steady at $16 to $17, Lake furnace, for Ohio and Indiana shipment, $17 to $17.50 for Michigan and $17, Cleveland, for local delivery.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$17.00
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.50
Ohio silvery, 8 per cent	25.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

IRON ORE

Some of the ore mining companies will resume operations about Oct. 1 of those underground mines that were shut down in the spring. This increase in ore production will not be due to any improvement in the demand for ore, but is the carrying out of the policy mapped out earlier in the year, when the mining companies decided that, with the restricted demand for ore, it would be better to furnish the miners employment during the winter than in the summer.

BARS, PLATES AND SHAPES

Orders for steel bars improved somewhat during the week. The gain was largely from the motor car industry and was only in small lots. Alloy steel bars show no increased activity. Plates and structural material continue to be dull. August business in the heavier steel products was less than in July. Activity in the building field is very light. No sizable inquiry came out during the week for work requiring either structural shapes or reinforcing bars. Bids for a water conduit, requiring 2400 tons of 60-in. steel pipe and 1600 tons of bars, will be taken by Toledo Sept. 9. A Lake shipyard is inquiring for 1200 tons of plates for vessel repair work. While there is some pressure from consumers for concessions, prices appear to be well maintained at 1.65c., Cleveland, for steel bars for local shipment and outside delivery and at 1.60c., Pittsburgh, for plates and shapes.

SHEETS

Quite a few orders are being placed for September requirements, but they are for small lots for early needs. A slight gain in demand is reported from the stove industry. Orders from the motor car industry show no up-trend. Stamping plants doing automotive work report an absence of inquiries from that source. Demand from the refrigerator industry has slackened. Ohio grave vault manufacturers, who normally consume a good tonnage of heavy gage sheets, are quiet. Manufacturers are finding much satisfaction in the fact that the new prices are being maintained.

STRIP STEEL

Demand for both hot and cold strip continues very light and is confined to small lots. Business from the motor car manufacturers show little, if any, gain. Parts makers are not securing new releases from automobile manufacturers and are ordering little material. Prices are steady at 1.55c., Pittsburgh, for wide strip, 1.65c. for narrow and 2.15c., Cleveland, for cold-rolled strip.

BOLTS, NUTS AND RIVETS

The market shows a firmer tone as a result of efforts of leading manufacturers to eliminate the recent weakness. However, price shading evidently has not yet entirely disappeared. While business is still very light, it showed a gain of 10 to 15 per cent in August over July. The industry is operating at not more than 30 per cent capacity. Rivets are very dull.

OLD MATERIAL

Mills continue to take scrap in very limited quantities and are placing no new orders. With limited production, scrap is not coming on the market in excess of the demand. Dealers are buying small lots of scrap for Valley shipment, paying $10 to $10.25 for No. 1 heavy melting and $7.50 to $7.75 for compressed sheet steel. Prices show no movement in either direction.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$8.50 to	$9.00
No. 2 heavy melting steel	7.50 to	8.00
Compressed sheet steel	7.50 to	7.75
Light bundled sheet stampings	6.50 to	7.00
Drop forge flashings	6.75 to	7.00
Machine-shop turnings	5.00 to	5.50
Short shoveling turnings	6.50 to	7.00
No. 1 railroad wrought	9.50 to	10.00
No. 2 railroad wrought	10.00 to	10.50
No. 1 busheling	6.75 to	7.00
Pipes and flues	5.50 to	6.00
Steel axle turnings	7.50 to	8.00
Acid Open-Hearth Grades:		
Low phos., billet bloom and slab crops	14.00 to	14.50
Blast Furnace Grades:		
Cast iron borings	6.50 to	6.75
Mixed borings and short turnings	6.50 to	6.75
No. 2 busheling	6.00 to	6.25
Cupola Grades:		
No. 1 cast	10.00 to	10.50
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft	15.00 to	15.50
Miscellaneous:		
Rails for rolling	13.00 to	13.50
Railroad malleable	11.00 to	11.25

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex	3.10c.
Cold-fin. flats and sq.	3.60c.
Hoops and bands, No. 12 to ⅛ in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galvanized sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10)	3.00c.
No. 9 ann'l'd wire, per 100 lb.	$2.25
No. 9 galv. wire, per 100 lb.	2.70
Com. wire nails, base per keg	2.10

*Net base, including boxing and cutting to length.

NEW YORK

Pig Iron Sales Larger—Steel Demand Lethargic

NEW YORK, Sept. 1.—Inquiry for pig iron is restricted to small lots totaling about 1000 tons. Despite the limited amount of business pending, sellers find encouragement in the broader interest among consumers in fourth quarter requirements. General buying for that period, however, is not expected to develop until later and will hinge upon general business improvement. Sales for the week, amounting to 6000 tons, were the largest since the week of July 23. No large orders were reported, the tonnage having been fairly well distributed among local and several New England melters.

The American Radiator Co. has received an order for 20,000 cast iron radiators for the Radio Center project. It is estimated that about 1400 tons of cast iron will be required for the work.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$19.41 to $19.91
*Buff. No. 2, del'd east. N. J.	17.78 to 18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	17.39 to 17.89
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

FINISHED STEEL

Signs of the expected seasonal upturn in steel business are entirely lacking in this market. Scarcely any steel company sales office can point to an increase in bookings, and in some lines, notably tin plate, specifications have fallen off. The outstanding development of the week was a request for bids by the Board of Transportation, New York, on 300 to 1500 steel subway cars. Bids were asked for on lots of 300, 500, 1000 and 1500. It is not known just how many will be ordered. Structural steel prospects are fairly promising. The 23,000 tons for the Parcel Post Building, New York, probably will be awarded this week, the general contract having been let. John A. Roebling's Sons Co., Trenton, N. J., was low bidder on the general contract for two bridges at Shelter Island, calling for 7000 tons of structural steel. The steel price situation remains stable.

CAST IRON PIPE

During a week practically devoid of new inquiry for pressure pipe, activity was sustained by several sizable lettings. R. D. Wood & Co. took 1400 tons of 6 to 14-in. centrifugal pipe for Wayne Township, N. J.; 1000 tons of various sizes for Long Lake, N. Y., and 600 tons of 12 to 24-in. for Washington. Racquette Lake, N. Y., awarded 200 tons to Central Foundry Co. Award of 1400 tons of 30-in., recently specified by Newport News, Va., has been postponed indefinitely. Yonkers, N. Y., is expected to place contract for 500 tons of 12-in. this week, and Boonton, N. J., will soon issue specifications for a quantity of 12-in. pipe for a water distribution system.

Prices per net ton delivered New York: Water pipe, 6-in. and larger, $32.30; 4-in. and 5-in., $35.90; 3-in., $42.90. Class A and gas pipe, $3 extra.

REINFORCING BARS

Quotations for billet steel reinforcing bars continue at 1.60c., Pittsburgh, or 1.93c., New York, with concessions of $1 and $2 a ton on the more substantial projects. Bids will be taken shortly by the New Jersey State Highway Commission on a section of highway from Mount Pleasant into Newark, which is expected to require a considerable tonnage of reinforcement steel.

OLD MATERIAL

Prices of all grades of scrap are unchanged, but lack firmness. No. 1 heavy melting steel is moving to the consumer at Coatesville, Pa., at $5 a ton, New York, and by barge to Buffalo at $6.25, on barge in New York harbor. Brokers report little interest in buying on the part of consumers and at the same time state that certain grades, especially No. 1 heavy melting steel, are not coming out freely at present prices.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$5.00 to $6.25
Heavy melting steel (yard)	3.00 to 3.50
No. 1 hvy. breakable cast.	6.50 to 7.00
Stove plate (steel works)	4.00
Locomotive grate bars	4.00
Machine shop turnings	2.00 to 2.50
Short shoveling turnings	2.50
Cast borings (blast fur. or steel works)	2.50 to 3.00
Mixed borings and turnings	2.00
Steel car axles	12.75 to 13.00
Iron car axles	15.00 to 15.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	5.50 to 6.00
Forge fire	4.50
No. 1 railroad wrought	8.25
No. 1 yard wrought, long	7.25
Rails for rolling	6.25 to 6.75
Stove plate (foundry)	4.75 to 5.50
Malleable cast (railroad)	6.50 to 7.00
Cast borings (chemical)	8.00 to 8.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$10.00 to $10.50
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)	8.00 to 8.50
No. 2 cast (radiators, cast boilers, etc.)	7.00 to 7.50

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. scrap, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ⅜ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10

	Per 100 Ft.
Boiler Tubes:	
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

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Announces "Liquilox," a Protective Coating

"Liquilox," a new liquid protective coating containing no dyes, lamp black, rosin, asphalt, gilsonite, vegetable or animal oils, and said to offer maximum, and often absolute, protection against all acids, alkalies, salts, indirect heats (from 1400 to 1500 deg. F.), waters and miscellaneous, destructive forces that deteriorate woods, fabrics, metals, stuccos, cements, etc., has been introduced to the trade by the Liquilox Co., Ltd., Los Angeles.

According to the manufacturers, this new protective coating is a product manufactured by secret process from an ore mined in the Western United States. It has been under the process of experimentation for over six years.

An example of its resistance to alkali is cited by the maker as follows: Seven plating tanks (of a major plating company), one containing 18 lb. of potassium cyanide per gal., were coated with one coat of Liquilox. After 18 months of service the tanks were examined and found to be in splendid condition and capable of many more months of service without reconstructing or reconditioning. "Liquilox," it is stated, may be applied with either gun or brush, to hot or cold surfaces, and does not require technical experience for application.

PHILADELPHIA

Steel Mill Operations Off—No Evidence of Fall Upturn

PHILADELPHIA, Sept. 1.—Operating rates of steel mills average 29 per cent of rated capacity, a slight decrease from the activity of recent weeks. Production is slightly under the average among plate mills and slightly above this average among shape producers. Expectations of the past few months that indications of fall improvement would be evident by the end of August have not been fulfilled, and in general the market for steel, pig iron and scrap is less active than early in August. Some improvement is looked for in September. Meanwhile, steel mills are maintaining operations by the accumulation of small orders coming from a wide range of industries.

The Navy Department, which is taking bids from shipyards for construction of 11 destroyers, is also asking steel mills to bid on furnishing 5500 tons of plates for the destroyers, some of which will probably be built in Navy yards.

PIG IRON

Foundries are maintaining the operating schedules that have prevailed through the summer, but are not increasing their melt of iron. In consequence, buying is still limited to carloads of foundry grade, usually at $16 a ton, furnace. A New York State furnace continues to be a factor in this district, its delivered quotation on most business being equivalent to $16 a ton, eastern Pennsylvania furnace. An inquiry from Baltimore calls for 100 tons of foundry iron. The Navy Department is asking for 1140 tons of foundry coke for various Navy yards. Basic iron is quiet, the low consumption of this grade being shown by the fact that two users are each operating only one open-hearth furnace.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$16.76 to $17.01
East. Pa. No. 2X, 2.25 to 2.75 sil.	17.26 to 17.51
East. Pa. No. 1X	17.76 to 18.01
Basic (del'd east. Pa.)	16.75
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

STEEL BARS

Buying is limited to small lots. Prices are firm at 1.60c., Pittsburgh, or 1.89c., Philadelphia. Billet steel reinforcing bars are quoted at 1.60c., Pittsburgh, or 1.89c., Philadelphia, with concessions of $1 and more a ton on desirable lots. Rail steel bars are 1.20c. to 1.30c., Pittsburgh, or 1.49c. to 1.59c., Philadelphia. One of the largest reinforced concrete projects in this district is a junior high school for Philadelphia, requiring 875 tons of bars.

SHAPES

Quotations are unchanged at 1.70c., f.o.b. nearest mill to consumer, or 1.76c., Philadelphia, with concessions of $1 a ton on the larger orders. Small fabricating shops continue to be in need of contracts, but only a few small projects are in the market.

PLATES

Orders are individually small, but it is by the accumulation of small lots that mills are able to maintain even the present low rate of operation. In each destroyer inquired for by the Navy Department 500 tons of plates will be used, of which 300 tons are to be ¼-in. and thinner and 200 tons more than ¼-in. thick. Quotations are unchanged at 1.70c., Coatesville, Pa., or 1.80½c., Philadelphia, with a small concession not unusual on large orders.

SHEETS

Local users of sheets are only moderately well engaged, and consequently their purchases are generally small. The radio industry continues to produce on a limited scale. One of the three leading makers is on a schedule of about 4000 sets a day. About 250 tons of galvanized sheets for ducts in the Philadelphia Savings Fund Building may be placed next week. Sellers suggest that this should provide a test of the firmness of the galvanized sheet price, as it is the first sizable order in this district since the new bases on sheets became effective two months ago.

IMPORTS

In the week ended Aug. 29, 2860 tons of chrome ore arrived at this port from Russia and 100 tons of ferromanganese was received from Germany. Steel imports consisted of 504 tons of structural shapes from Belgium, 319 tons of structural shapes and 39 tons of steel bands from Germany, and 17 tons of steel bars, three tons of drill steel and two tons of bearing tubes from Sweden.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ⅜-in. inclu.	2.90c.
Spring steel	5.00c.
Hot rolled, box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

OLD MATERIAL

Transactions in all grades of scrap are limited to small lots, usually distress carloads. No. 1 heavy melting steel is moving to the consumer at Coatesville, Pa., and the Phoenixville, Pa., mill is still accepting deliveries of machine shop turnings, stove plate and No. 2 heavy melting steel. Otherwise, the market is inactive and prices are unchanged, although lacking strength.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$8.00 to	$9.00
No. 2 heavy melting steel		7.00
No. 1 railroad wrought	10.00 to	10.50
Bundled sheets (for steel works)		6.50
Hydraulic compressed, new	7.00 to	8.00
Hydraulic compressed, old	6.00 to	7.00
Machine shop turnings (for steel works)	5.50 to	6.00
Heavy axle turnings (or equiv.)	8.00 to	8.50
Cast borings (for steel works and roll. mill)	5.50 to	6.00
Heavy breakable cast (for steel works)		10.50
Railroad grate bars	7.50 to	7.75
Stove plate (for steel works)	7.50 to	7.75
No. 1 low phos. hvy. (0.04% and under)	12.00 to	13.00
Couplers and knuckles		11.00
Rolled steel wheels		11.00
No. 1 blast furnace		5.50
Wrot. iron and soft steel pipe and tubes (new specific.)	10.50 to	11.00
Shafting	15.00 to	15.50
Steel axles	16.00 to	16.50
No. 1 forge fire	8.00 to	8.50
Cast iron carwheels	12.00 to	12.50
No. 1 cast	11.00 to	11.50
Cast borings (for chem. plant)	11.50 to	12.00
Steel rails for rolling		10.50

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Austin Co.'s Contracts Make Big August Gain

Construction contracts aggregating over $300,000 have been taken by the Austin Co., Cleveland, in the past 10 days, making the total amount taken in August 70 per cent above that in July, according to W. J. Austin, president of the company. The latest contracts include a $200,000 wholesale grocery warehouse in Topeka, Kan., for the Santa Fe Improvement Co.; a $40,000 sales and service building in Elmira, N. Y., for the International Harvester Co.; concrete lime slacking and sledge tanks in Salem, Ore., for the Oregon Pulp & Paper Co., involving $35,000, and a one-story commercial building in Ticonderoga, N. Y.

BUFFALO

More Interest in Pig Iron Market—Steel Operations Fluctuate

BUFFALO, Sept. 1.—A little more interest is apparent in the pig iron market, with an increasing volume of carload and 100-ton orders. Considerable activity exists in barge canal movement of iron. An inquiry for 1000 tons of foundry is attracting the attention of local producers, and two melters downstate have closed for smaller tonnages. One inquiry was for 300 tons of foundry for the American Locomotive Co. and the other was 150 tons of foundry and malleable. It has developed that buying during August was slightly better than producers had anticipated. Due to the fact that one very active producer in the East is out of the market, prices for shipments in New England are not as distressing as heretofore. On most orders, $15.50, base, is being obtained with not as much $15 iron going as previously. Considerable $16 malleable is being placed.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

FINISHED STEEL

The Lackawanna plant of the Bethlehem Steel Co. has added one open-hearth furnace, making nine in operation. Republic Steel Corpn. is operating three furnaces alternate weeks. The three furnaces were operated last week and are down this week, although better operation is being had on the 8-in. mill with three double turns a week. Other mill operation remains as before. The Erie passenger station at Jamestown, N. Y., which requires 100 tons of reinforcing bars, has been let, as well as 300 tons for State road work at Fairport, N. Y. The addition of several small school jobs requiring lath and bar joists makes the general situation in that department look better. Little activity is apparent in the fabricated structural field.

OLD MATERIAL

Some sales of No. 2 steel have been made at $8, but the leading consumer continues to offer only $7.50. This consumer is unable to obtain any large tonnage at this figure, but is acquiring small lots from time to time. While operations are still low, the market shows signs of slightly more strength. This is apparent in sales of No. 1 machinery cast scrap at $10.25 and as high as $10.50. Stove plate has also been sold at $8.50 and is reputed to be scarce. There is considerable activity among dealers and, with the lessened production, this is making for some degree of strength.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$9.00
No. 2 heavy melting scrap	$7.50 to	8.00
Scrap rails	9.50 to	10.00
Hydraul. comp. sheets		7.50
No. 2 hydraul. comp. sheets		7.00
Hand bundled sheets		7.00
Drop forge flashings		7.50
No. 1 busheling		7.50
Hvy. steel axle turnings	8.00 to	8.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Acid Open-Hearth Grades:		
Knuckles and couplers	10.50 to	11.00
Coil and leaf springs	10.50 to	11.00
Rolled steel wheels	10.50 to	11.00
Low phos. billet and bloom ends	13.00 to	14.00
Electric Furnace Grades:		
Short shov. steel turnings	6.00 to	6.50
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	4.50 to	5.00
Rolling Mill Grades:		
Steel car axles	15.00 to	15.50
Iron axles	16.00 to	16.50
Cupola Grades:		
No. 1 machinery cast	10.00 to	10.50
Stove plate	8.25 to	8.50
Locomotive grate bars	7.00 to	7.50
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.50 to	11.00
Malleable Grades:		
Industrial	10.00 to	10.50
Railroad	10.00 to	10.50
Agricultural	10.00 to	10.50
Special Grades:		
Chemical borings	9.00 to	9.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

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ST. LOUIS

Pig Iron Users Slow to Make Commitments—Some Scrap Grades Lower

ST. LOUIS, Sept. 1.—While melters seem to be showing more interest in their requirements they are disposed to wait until after Labor Day before closing contracts. In some cases they are willing to make commitments for the remainder of the year. An Iowa foundry bought 350 tons for delivery through the last quarter, whereas during the final quarter of 1930 its purchases approximated 1200 tons. Most other sales were of a carload up to 100 tons. The stove foundries continue to show an improvement in melt. Farm implement makers report a slack demand for their products.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

FINISHED STEEL

The demand for plates, shapes and bars has slowed up after a week of improvement. The market for sheets continues to be firm. Fabricators of structural steel report business is very dull, with no sizable projects in sight, and operations are at about 30 to 35 per cent of capacity.

OLD MATERIAL

For the second time in two weeks, the Missouri Pacific Railroad issued a special list of 100 carloads of scrap, which was telephoned to dealers, with bids expected the same day. These lists and 156 carloads from the same road in a regular list sent by mail have been taken care of by dealers. Most of the material must be laid down in yards, as mills are not in the market for supplies at this time. A Pennsylvania list of 17,875 tons and one of the Wabash for 4601 tons also were issued during the week. The latter list consisted of 3801 tons of 80 and 90-lb. relaying rails and 800 tons of scrap rail. No. 1 busheling and cast iron borings and shoveling turnings are 25c. a ton off, railroad malleable 50c. down and wrought iron bars and transoms are $1 lower.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$7.75 to	$8.25
No. 1 heavy melting or shoveling steel	7.75 to	8.25
No. 2 heavy melting or shoveling steel	7.00 to	7.50
No. 1 locomotive tires	9.00 to	9.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	8.50 to	9.00
Railroad springs	9.00 to	9.25
Bundled sheets	5.00 to	5.50
No. 2 railroad wrought	7.75 to	8.25
No. 1 busheling	6.25 to	6.75
Cast iron borings and shoveling turnings	5.25 to	5.75
Iron rails	7.00 to	8.00
Rails for rolling	10.50 to	11.00
Machine shop turnings	3.00 to	3.50
Heavy turnings	6.00 to	6.50
Steel car axles	11.50 to	12.00
Iron car axles	15.00 to	15.50
Wrot. iron bars and trans.	6.50 to	7.00
No. 1 railroad wrought	5.00 to	5.50
Steel rails, less than 3 ft.	11.00 to	11.50
Steel angle bars	7.75 to	8.25
Cast iron carwheels	6.75 to	7.25
No. 1 machinery cast	8.00 to	8.50
Railroad malleable	6.50 to	7.00
No. 1 railroad cast	7.50 to	8.00
Stove plate	7.00 to	7.50
Relay. rails, 60 lb. and under	16.00 to	16.50
Relay. rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	6.50 to	7.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60

BIRMINGHAM

Steel Operations Increased Slightly—Pig Iron Market Remains Dull

BIRMINGHAM, Sept. 1.—The pig iron market enters September with prospects still slim and doubtful. Demand remains spotty and irregular, with the bulk of the tonnage being sold on a day-to-day basis. Quotations continue at $12, base, for district business. August shipments were slightly better than those of July, but were considerably under current production. No changes were made during the past week in furnace operations, eight being active. Of these, seven are on foundry and one on basic.

Prices per gross ton, f.o.b. Birmingham dist furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50
Basic	12.00

FINISHED STEEL

Steel bookings last week were about the same as for the preceding two weeks, the amount being rather small. Early prospects are not very bright. The Tennessee company increased open-hearth operations at Fairfield last week from four to five and this week is planning to have six in operation. Gulf States Steel continues to operate three. Fabricators did not book any important tonnage.

CAST IRON PIPE

Current business is light and in small amounts. Most of the current orders are under 100 tons. Day-to-day bookings are being depended on largely to sustain operations even at 40 to 50 per cent. The National Cast Iron Pipe Co. has booked 300 tons for Columbia, S. C.

OLD MATERIAL

During the past several weeks shipments on contracts have been about the only activity in old material. Within the past few days even these shipments have been sharply reduced. Quotations are unchanged.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$8.50 to $9.00
Scrap steel rails	8.50
Short shoveling turnings	6.50
Cast iron borings	(No market)
Stove plate	7.00
Steel axles	15.00 to 16.00
Iron axles	18.00
No. 1 railroad wrought	8.00
Rails for rolling	11.50 to 12.00
No. 1 cast	9.00
Tramcar wheels	10.00 to 10.25
Cast iron borings, chem.	13.50

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BOSTON

Some Scrap Moves to Pittsburgh—Pig Iron Sales Mainly for Prompt Shipment

BOSTON, Sept. 1.—A fairly good total of pig iron was disposed of in the past week, all of which was in carlots or less, but in line with indications, noted a week ago, that foundries are bare of supplies. More than 1200 tons was sold, with Mystic Iron Works getting a large part of the business, and most of the remainder going to Buffalo. The feeling persists among furnace representatives that foundries will be compelled to take more iron from now on. Buying is done very cautiously, but it is noted that practically every order is for immediate delivery. Prices are firm.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91
*Buffalo, sil. 2.25 to 2.75	19.91
†Buffalo, sil. 1.75 to 2.25	19.28
†Buffalo, sil. 2.25 to 2.75	19.28
*Ala., sil. 1.75 to 2.25	$20.11 to 20.61
*Ala., sil. 2.25 to 2.75	20.61 to 21.11
†Ala., sil. 1.75 to 2.25	16.75
†Ala., sil. 2.25 to 2.75	17.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.
*All rail rate.
†Rail and water rate.

REINFORCING BARS

Nearly 1000 tons was contracted for in the past week. The Massachusetts Highway Commission took 500 tons, placing 100 tons with Truscon Steel Co. and the other 400 tons with Concrete Steel Co. Joseph T. Ryerson & Son, Inc., took the 250-ton contract for a storage warehouse at Hartford, Conn. Several small projects resulted in about 200 tons more being sold.

OLD MATERIAL

A somewhat better feeling has developed in scrap. This grows out of the fact that for the first time in many weeks Pittsburgh mills came into this market for some heavy materials for quick delivery. The shipments included heavy melting steel, rails, heavy cast and textile cast. The fact that Pittsburgh mills took any supplies at all was stimulating, as that center has been out of the local market for some time. In the meantime, local foundries are absolutely disinterested, business failing to show any pick-up for them. There were no price changes for any of the materials that were moved, dealers and brokers being well satisfied to start something along. There is not much of a supply on hand, however, collectors having been disinterested for some time on account of the low prices.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$4.50 to $5.00
Scrap T rails	4.00 to 4.50
Scrap girder rails	3.00 to 3.50
No. 1 railroad wrought	7.00 to 7.50
Machine shop turnings	1.25 to 1.80
Cast iron borings (steel works and rolling mill)	1.50 to 1.75
Bundled skeleton, long	3.00 to 3.25
Forged flashings	5.00 to 5.25
Blast furnace borings and turnings	1.50 to 1.75
Forge scrap	0.50 to 0.80
Shafting	10.00 to 10.50
Steel car axles	11.00 to 12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	5.00 to 5.25
Rails for rolling	7.50 to 8.00
Cast iron borings, chemical	7.00 to 7.25
No. 2 cast	5.00 to 5.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$9.50 to $10.00
No. 1 machinery cast	9.50 to 10.00
Stove plate	5.00 to 5.25
Railroad malleable	13.00 to 13.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.36½c.
Structural shapes—	
Angles and beams	3.36½c.
Tees	3.36½c.
Zees	3.36½c.
Soft steel bars, small shapes	3.26½c.
Reinforcing bars	3.11½c. to 3.26½c.
Iron bars—	
Refined	3.26½c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 5.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex.	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.

	Per Cent Off List
Machine bolts	65 and 5
Carriage bolts	65 and 5
Lag screws	65 and 5
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

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Youngstown

September Starts with No Improvement in Steel Schedules

YOUNGSTOWN, Aug. 31.—To the disappointment of Valley steel makers, August brought little change to the industry, and the new month will begin, much as did its predecessor, with expectation of limited improvement in demand, but with little assurance that any increase in orders will be more than seasonal. Nevertheless, small orders from the automotive industry during the last week or two have indicated heavier September releases for work on new models, and this consuming industry, which is always of great importance to Valley mills, is counted upon to take its usual place as the largest consumer of steel during the fall.

Production of line pipe is also expected to continue at the present rate or better for another month or six weeks, and local fabricators of steel building products foresee no immediate curtailment of their steel needs. With activity in other steel lines at a comparative standstill, such improvement as may come from the automotive industry will likely be reflected very quickly in the operating rates of both steel-making units and finishing mills.

Orders for line pipe in the last fortnight have been small in size, but the total involved has been encouraging.

The Standolind Pipe Line Co., Tulsa, Okla., took bids on Aug. 29 on 36,000 tons of pipe, the order for which may be shared by Valley mills. Other inquiries generally involve small tonnages for feeder and auxiliary lines. While demand for standard pipe threatened to improve several times during the month, aggregate shipments finally ended the period at just about the same level as July.

Sheet specifications continue to be light, reflecting the heavy shipments at old prices made during July. Many consumers still have enough material on hand to last for a good part of September at the present rate of consumption and will not be in the market again before the end of the quarter. Some fourth quarter inquiry has already come from the automotive industry and mills in this district are quoting the full schedules. The same situation holds true for strip steel, although demand has been slightly heavier in the last week or two. Quotations of 1.55c. and 1.65c., Pittsburgh, on hot-rolled strip and 2.15c. on cold-rolled seem to be holding unusually well.

Demand for merchant wire products is slightly better. One mill, which has been idle for some time, is again active. Manufacturers' wire is still very dull, but movement of rods is a bit better. The local tin mill operated at close to capacity last week and its present schedule is somewhat above the average for the industry. Bar production is not above 30 per cent of capacity, and, with the exception of reinforcing bars, demand shows little change. Plates are very dull.

Steel ingot production this week will show little change, although activity in the Shenango Valley mills is lower. The Republic Steel Corpn. continues to operate its Mahoning Valley mills at a much better rate than its other properties, with approximately half of the available open-hearth capacity active. Bessemer units are not so well engaged. The other large independent company is not making steel at as high a rate as it was earlier in the month, while Sharon Steel Hoop Co. continues to operate two of its six available furnaces, following a change which brought a temporary increase in production.

Steel-making activity in the Valleys as a whole may be estimated at 35 per cent of capacity, which is close to the average for August. Labor Day suspensions may reduce this rate sharply before the end of the week, but the interruption will not be extended for more than three days.

Stocks of both raw steel and pig iron in the Valleys are fairly large, at least when the light requirements of finishing mills are considered. No change is reported in the raw materials markets, although scrap is weaker, with heavy melting steel quotable at $10 to $10.50 and compressed sheets 50c. a ton lower.

PACIFIC COAST

Outlook for September is Fairly Promising—Current Business Light

SAN FRANCISCO, Aug. 31.—August closes with little to differentiate it from the seasonal low which was characteristic of July. Although figures to be compiled during the coming week may indicate a slight improvement, the general tone of inactivity continues. A double holiday over the coming week-end will disturb lettings for the first two weeks of the new month, but it is more than probable that part of the growing number of projects on which plans are being prepared will be out for bids and awards in September. Moreover, sheet buyers will again be in the market for stocks. Public work continues to account for well over half of current steel tonnage.

F.O.B. Warehouse Prices
(Less than 5000 Lb.)

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	2.80c.	3.00c.	2.40c.
Soft steel bars	2.80c.	3.00c.	2.40c.
Reinforcing bars	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10)	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	3.85c.
Struc. rivets, ½ in. and larger, less than 1000 lb.	5.00c.	5.00c.	5.50c.
Special nails: common 4 to 60d; smooth box 4 to 20d; finish 6 and 8d; base per keg	$2.55	$2.45	$2.40
Other wire nails, base per keg	2.80	2.70	2.65
Cement c't'd nails, 100-lb. keg	2.65	2.70	2.65

BARS

Open lettings on major specifications reported were slightly over 1100 tons, with new inquiries for practically the same amount. About 8000 tons remain open, including 3000 tons for the Golden Gate bridge approaches.

PLATES

Three awards take 1200 tons, including 600 tons for a penstock for the California Oregon Power Co. at Prospect, Ore., to the Minneapolis Moline Power Implement Co., and 400 tons for the San Francisco municipal (Lower Cherry Creek) viaduct, on which the Steel Tank & Pipe Co. was low. No important inquiries were received.

SHAPES

During the next two weeks it is expected that the Third Street bridge project at San Francisco, requiring 1500 tons, and a grade separation at First and Glendale Streets, Los Angeles, calling for 1300 tons, will be out for figures. Awards totaling 625 tons and inquiries for 2500 tons were entered.

CAST IRON PIPE

New inquiries were received for a total of 2000 tons, including 465 tons of 6 to 12-in. for Helena, Mont.; 310 tons of 6-in. for Mill Valley, Cal., and 930 tons for San Rafael, Cal., for a five-mile line of 12-in. to the new Army bombing base at Marian Meadows. About 7000 tons is pending, principally a 6400 ton specification at Los Angeles to be opened during the coming week.

RAILS

The Pacific Coast Steel Co. was awarded 450 tons of 122-lb. girder rails for the Market Street Railway Co. at San Francisco. Los Angeles County will open bids Sept. 8 on 104 tons of 65-lb. relaying rails for a levee flood control project on the Los Angeles River.

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CINCINNATI

Pig Iron Still Affected by Vacation Lull—Northern Prices Weak

CINCINNATI, Sept. 1.—The usual vacation lull in August brought the level of pig iron demand in this market below that of July. Consumers of pig iron, of course, covered for imperative requirements, but showed no interest in future business. The final week of the month brought the total sales to approximately 1300 tons, of which about 250 tons was sold by Southern furnaces. Shipments of pig iron during the month have slowed down, and in some instances furnace representatives report that consumers, who had closed for fairly substantial tonnages, are not taking material in specified quantities. The Northern market continues to be characterized by weakness of prices, while the Southern furnaces are adhering to present quotations.

Prices per gross ton, deliv'd Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

FINISHED STEEL

Except for a few scattered purchases by automotive manufacturers, there is relatively no movement of sheets into that field, although other sheet-consuming channels are maintaining a fairly level demand for reduced quantities. August demand for sheets was below that of July, al-

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50
	Net per 100 Ft.

though manufacturers look forward to a renewal of buyer interest the middle of September. Sheet production in this district is at less than 40 per cent. Inquiry is lacking, since buyers are usually purchasing from their regular sources without seeking competitive quotations.

RAILS AND TRACK SUPPLIES

Contracts for a quantity of steel rails and accessories for the construction of the new passenger depot at Cincinnati were awarded last Thursday by the Cincinnati Union Terminal Co. as follows: 1454 gross tons steel rails, to Inland Steel Co., Chicago; 7800 steel rail joints, to Rail Joint Co., Chicago; 276,000 tie plates, to Carnegie Steel Co., Pittsburgh; 86,000 track bolts, to the Republic Steel Corpn., Youngstown; 91,000 lock washers, to the Reliance Mfg. Co., Massillon, Ohio; 2940 kegs railroad spikes, to the Bethlehem Steel Co., Steelton, Pa.; 25,000 lag screws, Republic Steel Corpn. A portion of the material is to be shipped to Cincinnati in October, but the bulk is to be shipped by Feb. 1, 1932.

OLD MATERIAL

With dealers unwilling to sell scrap at present buyers' offers, there is relatively no activity in the market. Some dealers are buying scrap and awaiting a firmer market condition before disposing of it. Small quantities, of course, are being sold from time to time as consumers' needs require.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$7.25 to	$7.75
Scrap rails for melting	9.00 to	10.00
Loose sheet clippings	3.50 to	4.00
Bundled sheets	6.75 to	7.25
Cast iron borings	3.75 to	4.25
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.75 to	6.25
No. 2 busheling	3.75 to	4.25
Rails for rolling	10.50 to	11.00
No. 1 locomotive tires	9.50 to	10.00
No. 2 railroad wrought	7.25 to	7.75
Short rails	12.50 to	13.00
Cast iron carwheels	10.00 to	10.50
No. 1 machinery cast	10.50 to	11.00
No. 1 railroad cast	11.00 to	11.50
Burnt cast	5.25 to	5.75
Stove plate	5.25 to	5.75
Brake shoes	5.25 to	5.75
Agricultural malleable	9.50 to	10.00
Railroad malleable	10.50 to	11.00

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DETROIT

Detroit Water Shipments and Other Factors Still Complicate Steel Price Situation

DETROIT, Aug. 31.—Although the establishment of a Detroit base for quoting bars has been abandoned, the question of working out a feasible method for pricing steel products for delivery to the automobile industry in Michigan is far from being a dead issue. The custom of certain steel mills that enjoy water shipping facilities of quoting a delivered price based on a quotation at the point of production plus a low water transportation rate to Detroit persists. This is the most troublesome factor to be considered at present in seeking a stabilizing influence and eliminating sizable concessions.

It is reported that a movement is on foot to set up more firmly the practice of adhering to an all-rail rate from the various steel mills in quoting to the automotive trade, but whether this really will lead to a betterment of conditions cannot be predicted. Because of the large consumption in a comparatively small area of which Detroit is the center, this district is the meeting place for low steel prices. A large gain in water movement of steel has aggravated the situation. The presence of local mills has added further complications. All of these factors have made the local steel trade somewhat pessimistic about what actually can be accomplished in putting prices on as firm a basis as they are in other parts of the country.

Steel specifications have been extremely light, and little pick-up in bookings is anticipated until the latter part of September.

PIG IRON

Shipments to consumers in this district during August were 10 per cent greater than in July, which was a poor month. The Dodge foundry and plants in the Port Huron area working on Plymouth castings have been taking iron at a good rate. The Packard foundry likewise is running at a satisfactory level. The Cadillac foundry has resumed work after a shutdown of several weeks, during which extensive improvements were made. The Ford foundry at Rouge has been idle since Aug. 1. Melters in the Muskegon district are operating on a light schedule. The Chevrolet gray iron foundry at Saginaw is receiving iron by water from Buffalo furnaces to be stocked for use during the winter months when Lake navigation is closed.

OLD MATERIALS

With dealers' yards well stocked with scrap and steel mills disinclined to make purchases, the local market is showing a tendency toward further weakness. Quotations have not changed, but are less firmly entrenched than a week ago.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$6.50 to	$7.00
Borings and short turnings	4.50 to	5.00
Long turnings	4.00 to	4.50
No. 1 machinery cast	8.00 to	8.50
Automotive cast	11.00 to	11.50
Hydraul. comp. sheets	6.50 to	7.00
Stove plate	5.25 to	5.75
New No. 1 busheling	5.25 to	5.75
Old No. 2 busheling	2.50 to	3.00
Sheet clippings	4.00 to	4.50
Flashings	5.50 to	6.00

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Canada

Structural Steel Is Most Active Branch of Trade

TORONTO, Aug. 31.—The outstanding developments in the Canadian iron and steel industry are in structural steel. Several large contracts were placed by the Quebec Government for bridge construction, while a number of others are pending. It is estimated that Quebec's bridge building program alone will involve the use of upward of 20,000 tons of steel, while other large projects in the Province will materially boost this total.

PIG IRON

While this market is devoid of special feature, sales were well sustained and reached a fair total in comparison with the previous week. Melters are holding purchases strictly to spot requirements. Prices are unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	20.50

OLD MATERIAL

This market is comparatively dull. Sales are running to single car lots, with consumers declining to place future contracts. Prices are unchanged.

Dealers' buying prices for old material:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast		16.00
Stove plate		8.00
Standard carwheels		[illegible]
Malleable		8.00
	Per Net Ton	
No. 1 machinery cast	11.00	
Stove plate	9.00	
Standard carwheels	10.00	
Malleable scrap	9.00	

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 27c.
Manganese ore, African or Indian, 50 to 52%	24c. to 26c.
Manganese ore, Brazilian, 46 to 48%	22c. to 24c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50

	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, 3-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.60 to .75
Gas slack, f.o.b. W. Pa. mines	.60 to .75

Ferromanganese

	Per Gross Ton
Domestic, 80% seaboard	*$80.00 to $85.00
Foreign, 80%, Atlantic or gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	31.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$18.00 to $20.00	11%	$21.00 to $23.00
7%	18.50 to 20.50	12%	22.00 to 24.00
8%	19.00 to 21.00	13%	24.00 to 26.00
9%	19.50 to 21.50	14%	26.00 to 28.00
10%	20.00 to 22.00	15%	28.00 to 30.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carlonds, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$13.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

Per 1000 f.o.b. Works

	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00	$32.00 to $35.00
Maryland	40.00	32.00 to 35.00
New Jersey	44.00 to 59.00	.....
Ohio	40.00	32.00 to 35.00
Kentucky	40.00	32.00 to 35.00
Missouri	37.00	32.00 to 35.00
Illinois	40.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts ... ¾	73 and 10
†Carriage bolts	73 and 10
Lag bolts	73 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square	73 and 10
Hot-pressed nuts, blank or tapped, hexagons	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ¾ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.	73 and 10
Stove bolts in packages, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland.	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland.	80, 10, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.89c.
Del'd New York	1.93c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.70c.
C.i.f. Pacific ports	2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.55c. to 1.60c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c. to 1.35c.
F.o.b. Chicago Heights mill	1.60c.
Del'd Philadelphia	1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago	1.70c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.80½c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.88c.
C.i.f. Pacific ports	1.85c. to 1.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.71c. to 1.76c.
Del'd New York	1.85½c.
C.i.f. Pacific ports	2.05c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh	1.65c.
Wider than 6 in., P'gh	1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.75c. to 1.85c.
Cooperage stock, Chicago	1.85c. to 1.95c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.15c.
Strips, Cleveland	2.15c.
Strips, deliv'd Chicago	2.43c.
Strips, Worcester	2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base Per Keg
Standard wire nails	$1.90
Smooth coated nails	1.90
Galvanized nails	3.90

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.35c.
Galvanized staples	2.60c.
Barbed wire, galvanized	2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

To Retail Trade

	Base Per Keg
Standard wire nails	$2.00
Cement coated nails	2.00
Galvanized nails	4.00

	Base per Lb.
Smooth annealed wire	2.45c.
Smooth galvanized wire	2.90c.

	Base per Lb.
Polished staples	2.45c.
Galvanized staples	2.70c.
Barbed wire, galvanized	2.65c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$60.00
Woven wire fence, 12½ gage and lighter, per net ton	65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Sheets

Hot-Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.70c.
No. 10, f.o.b. Chicago mills	1.80c.
No. 10, del'd Philadelphia	1.99c.
No. 10, f.o.b. Birmingham	1.85c.
No. 10, c.i.f. Pacific Coast ports	2.33c.

(Note: To above prices are added extras for annealing and for width over 48 in., and for less than five tons of each gage or size.)

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Chicago mills	2.50c.
No. 24, del'd Philadelphia	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, c.i.f. Pacific Coast ports	2.88c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.35c.
No. 10 gage, f.o.b. Chicago mills	2.45c.
No. 10 gage, del'd Philadelphia	2.64c.
No. 10 gage, f.o.b. Birmingham	2.50c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Chicago mills	3.05c.
No. 20 gage, del'd Philadelphia	3.24c.
No. 20, f.o.b. Birmingham	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.10c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.75c.
No. 20, f.o.b. Pittsburgh	3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring).

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.90c.
No. 24, f.o.b. Chicago Mills	3.00c.
No. 24, del'd Philadelphia	3.19c.
No. 24, f.o.b. Birmingham	3.05c.
No. 24, c.i.f. Pacific Coast ports	3.38c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	3.15c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.90c.
No. 20, f.o.b. Pittsburgh	3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Chicago mills	2.75c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills	$5.00
Standard cokes, f.o.b. Gary	5.10

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C. $10.30	25-lb. coating I.C. $15.20
15-lb. coating I.C. 12.90	30-lb. coating I.C. 16.00
20-lb. coating I.C. 14.00	40-lb. coating I.C. 17.80

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2500	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Round and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in and larger	$2.70
Spikes, ½ in. and larger	2.70
Spikes, boat and barge	2.90
Tie plate, steel	1.95
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49⅛	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2 in.—2½ in.	13
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper and Tin Quiet —Lead Active for Prompt Shipment

NEW YORK, Sept. 1.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Sept. 1	Aug. 31	Aug. 29	Aug. 28	Aug. 27	Aug. 26
Lake copper, New York	7.87½	7.87½	7.87½	7.87½	7.87½	7.87½
Electrolytic copper, N. Y.*	7.25	7.25	7.25	7.25	7.25	7.25
Straits tin, spot, N. Y.	26.75	27.12½	....	26.95	27.00	27.00
Zinc, East St. Louis	3.80	3.80	3.80	3.80	3.80	3.80
Zinc, New York	4.15	4.15	4.15	4.15	4.15	4.15
Lead, St. Louis	4.22½	4.22½	4.22½	4.22½	4.22½	4.22½
Lead, New York	4.40	4.40	4.40	4.40	4.40	4.40

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.60c. to 6.65c. a lb., New York.

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COPPER

Electrolytic copper is still available in small lots from custom smelters at 7.50c., delivered Connecticut Valley, but the tonnage at this price is diminishing, with custom sellers endeavoring to maintain 7.75c., delivered, as a minimum. During the week, smelters which had been selling at the lower quotation endeavored to firm up their price to 7.75c., delivered, but sales declined and offers of the former price for small lots brought in some tonnage. Primary producers continue to quote 8c. a lb., delivered, but are occasionally selling to regular customers at 7.75c. Meanwhile, the price of Copper Exporters, Inc., is unchanged at 8c., c.i.f. usual Continental ports. Foreign buying continues small, with European consumers not satisfied as to the disparity between the domestic and export prices. Export sales in August totaled only 15,300 tons, compared with 17,500 tons in July, which was also a small month in foreign transactions. Germany, under normal conditions a large consumer of copper, has been a minor factor recently. Stocks of copper held by European consumers are reported to be small, so that sellers here suggest that, should the domestic market advance sufficiently to bring back the usual differential between domestic and export quotations, substantial requirements now being withheld by Continental users would be released. Lake copper is quiet, and the price is unchanged at 7.87½c., delivered.

COPPER AVERAGES

The average price of Lake copper based on daily quotations in THE IRON AGE, is 7.96c. a lb. for August, delivered New York. The average price of electrolytic copper is 7.26c., refinery, or 7.51c., delivered in the Connecticut Valley.

TIN

Domestic buying has been limited to transactions in small lots. The price has been fairly stable except for a slight advance on Monday and a decline today. The decrease today was attributed in part to unofficial August statistics from London, which placed the decrease in visible and invisible stocks at less than had been expected. These reports estimate total shipments to the United States at 5200 tons to the Atlantic and 70 tons to the Pacific Coast. One London house estimates the decrease in the visible supply of tin at 487 tons, and it is further estimated that the carryover in the East decreased 838 tons. Shipments of tin from Singapore are placed at 6000 tons for August, despite suspension of operations by the smelter there for part of the month, which had led to early estimates that the total would not exceed 4500 tons. Previous estimates of August production have apparently been exceeded by about 2037 tons. About 11,800 tons of tin is reported to be available for shipment from Singapore in September, and on this basis it is believed that 6000 to 6500 tons may be shipped. Supplies of tin in United Kingdom warehouses are estimated to have increased one ton in the past week. Today's quotations in London were £120 for spot standard, £122 10s. for future standard, £121 7s. 6d. for spot Straits and £126 12s. 6d. for shipment from Singapore.

LEAD

Unlike the other metal markets, demand for lead continues active, although buying is almost exclusively for prompt shipment. The greatest market activity of the past week was on Friday, with substantial buying on Monday and again today. The buying movement has been well distributed over various consuming industries, including cable and battery manufacturers, ammunition plants, makers of foil, lead sheets and pipe. Prices continue firm at 4.22½c., St. Louis, and 4.40c., New York.

ZINC

Only small lots of zinc are being bought for prompt shipment, consumers showing no interest in forward buying. The price is unchanged at 3.80c. a lb., East St. Louis, or 4.15c., New York. Minor selling at a few points concession from these prices, which was in evidence a week ago, has disappeared.

ANTIMONY

Quotations for the Chinese metal are slightly irregular, certain importers asking 6.65c. a lb., duty paid,

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	15.37½c.
*Copper, hot rolled, base sizes	17.62½c.
Seamless Tubes—	
Brass	20.25c.
Copper	20.12½c.
Brass Rods	13.62½c.
Brazed Brass Tubes	24.25c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Zinc sheets, open	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	28.75c. to 29.75c.
Tin, bar	30.75c. to 32.75c.
Copper, Lake	9.75c. to 10.75c.
Copper, electrolytic	9.25c. to 9.75c.
Copper, casting	9.00c. to 9.50c.
Zinc, slab	5.00c. to 5.50c.
Lead, American pig	5.25c. to 6.25c.
Lead, bar	7.00c. to 8.00c.
Antimony, Asiatic	9.50c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	20.00c. to 22.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	20.00c. to 30.00c.
Solder, ½ and ½	18.00c. to 19.00c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	31.50c.
Tin, bar	33.50c.
Copper, Lake	8.87½c.
Copper, electrolytic	8.87½c.
Copper, casting	8.25c.
Zinc, slab	5.50c. to 5.75c.
Lead, American pig	5.25c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	35.50c.
Solder, ½ and ½	21.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.00c.	6.75c.
Copper, hvy. and wire	5.75c.	6.50c.
Copper, light and bottoms	4.75c.	5.50c.
Brass, heavy	3.25c.	4.00c.
Brass, light	2.50c.	3.50c.
Hvy. machine composition	4.75c.	5.50c.
No. 1 yel. brass turnings	3.50c.	4.25c.
No. 1 red brass or compos. turnings	4.25c.	5.00c.
Lead, heavy	3.25c.	3.75c.
Zinc	1.50c.	2.00c.
Sheet aluminum	9.50c.	11.50c.
Cast aluminum	3.50c.	5.50c.

New York, while others are still willing to sell at 6.60c., New York. It is suggested that on a substantial tonnage of Chinese antimony lower than 6.60c., New York, could be obtained. Current buying is decidedly small. The flood conditions in China are expected to curtail future shipments of the metal, some 2700 tons of which is now unavailable in Chang Cha warehouses and 400 tons in Hankow, both in the flood area. Warehouse stocks are available, however, in other Chinese cities.

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FABRICATED STRUCTURAL STEEL

Awards of 76,000 Tons Include Chicago Post Office—New Projects Small with Only 20,000 Tons

WITH the total of fabricated structural steel awards at 76,000 tons, the week is the largest since the middle of July, when the Golden Gate bridge at San Francisco was placed. Swelling this week's total are 48,200 tons for a Post Office in Chicago, 8000 tons for harbor improvement and 7000 tons for a viaduct, both in Milwaukee, 1600 tons for a laboratory in Madison, Wis., and 4500 tons for bridges in the Province of Quebec.

New structural steel projects at 20,000 tons, compare with 36,500 tons a week ago and 24,000 tons two weeks ago. Included are 2000 tons for a high school in Chicago, 1200 tons for approaches to University Bridge in Seattle, Wash., and 1000 tons for an apartment building in Philadelphia. Awards follow:

North Atlantic States

BOSTON & MAINE RAILROAD, 100 tons, bridges at Tilton, N. H., and Gardner, Mass., to Boston Bridge Works, Inc.

MEDFORD, MASS., 150 tons, additional car facilities for Boston Elevated Railway, to New England Structural Co.

LAKE PLACID, N. Y., 300 tons, arena, to American Bridge Co.

STATE OF NEW YORK, 105 tons, bridges RC-2141 in Shenango County, to Lackawanna Steel Construction Co.

PLATTSBURG, N. Y., 160 tons, theater and gymnasium for United States Army barracks, to Weatherly Steel Co.

NEW YORK, 126 tons, garage at 431 East Seventy-fifth Street, to Mayer & Kornbau.

NEW YORK, 700 tons, office building for Stumpp & Walter at Warren and Church Streets, to an unnamed fabricator.

NEW YORK, 311 tons, garage at 159 East Eighty-third Street, to Cosmic Iron Works.

NEW YORK, 200 tons, garage at 348 West Twenty-seventh Street, to Frederick Steel Co.

ONEONTA, N. Y., 170 tons, Normal School, to Ingalls Iron Works.

GARRISON, N. Y., 160 tons, building for Franciscan Monastery, to George L. Schnatz Iron Works.

BROOKLYN, 100 tons, building on Flatbush Avenue for Fulton Savings Bank, to George A. Just, Inc.

RUTHERFORD, N. J., 130 tons, high school, to Hudson Structural Steel Co.

READING COMPANY, 200 tons, bridge in Philadelphia, to American Bridge Co.

BALTIMORE, 200 tons, Loney's Lane bridge, to American Steel Engineering Co.

AMBRIDGE, PA., 750 tons, mill building for Spang, Chalfant & Co., Inc., to American Bridge Co.

The South

FORT WORTH, TEX., 700 tons, Post Office, to Mosher Steel & Machinery Co.

Central States

COLUMBUS, OHIO, 140 tons, Bexley School, to C. E. Morris.

MILWAUKEE, 8000 tons, sheet steel piling, for harbor improvement work; 6400 tons to Bethlehem Steel Co. and 1600 tons to Inland Steel Co.

MILWAUKEE, 7000 tons, viaduct to Wisconsin Bridge Co., Lakeside Bridge & Structural Co., Worden-Allen Co. and Milwaukee Bridge Co.

MADISON, WIS., 1600 tons, United States Forest Tree Products laboratory, to Mississippi Valley Structural Steel Co.

CHICAGO, 48,200 tons, Post Office, to American Bridge Co.

CHICAGO, 400 tons, Pepsodent Co., to Mississippi Valley Structural Steel Co.

QUINCY, ILL., 500 tons, high school, to Michelmann Structural Steel Co.

Western States

CENTRAL POINT, ORE, 700 tons, power plant, to Minneapolis-Moline Power Implement Co.

CORCORAN, CAL., 125 tons, for cotton gin, to consolidated Steel Co.

Canada

YAMASKA COUNTY, QUE., 2000 tons, bridge over St. Francis River for Provincial Government, to Canadian Vickers.

ST. MICHAEL, QUE., 2500 tons bridge over Yamaska River for Provincial Government, to Mackinnon Steel Corpn., Sherbrooke, Que.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

UXBRIDGE, MASS., 130 tons, State bridge.

GREAT BARRINGTON, MASS., 140 tons, State bridge.

BOSTON, 250 tons, chapel and parish house for New Old South Church.

MILLBURY, MASS., 300 tons, three State bridges; bids open Sept. 15.

WORCESTER, MASS., 2800 tons, memorial auditorium; construction postponed for a year.

NEW YORK, 400 tons, addition to school No. 138 in Borough of Queens; M. L. Lundin Contracting Co., New York, low bidder on general contract.

NEW YORK, 23,000 tons, Port of New York Authority warehouse, previously reported as 20,000 tons; bids open Sept. 11.

NEW YORK, 500 tons, pier shed for Board of Transportation.

PHILADELPHIA, 1000 tons, apartment building.

PHILADELPHIA, 500 tons, junior high school.

STATE OF NEW JERSEY, 150 tons, bridge on route 2, section 6 in borough of Paramus, Bergen County.

STATE OF NEW JERSEY, 2050 tons, highway construction, route 25, sections 8 and 8A. General contractor International Engineering Co. and steel erection by Karl Koch, New York.

STATE OF NEW JERSEY, 8500 tons, overhead express highway on route 25, sections 7, 7A, and 8, low bidder Taylor-Fichter Steel Construction Co.

SUFFOLK COUNTY, N. Y., 7000 tons, bridges at Shelter Island, low bidder John A. Roebling's Sons Co.

LONG ISLAND RAILROAD, 150 tons, bridge at Mineola, N. Y.

The South

LOUISVILLE, KY., 550 tons, sheet piling for Mill Creek sewer; Arundel Corpn., Baltimore, low bidder.

KROTZ SPRINGS, LA., 3335 tons, State highway bridge; Foundation Co., New York, low bidder on general contract.

MORGAN CITY, LA., 4590 tons, State highway bridge, Foundation Co., New York, low bidder on general contract.

NEW ORLEANS, 58,000 tons, bridge across Mississippi River; bids to be received jointly Sept. 15 by State of Louisiana and Public Belt Railway of New Orleans.

Central States

TWO RIVERS, WIS., 550 tons, State highway span; Worden-Allen Co., low bidder.

MILWAUKEE, 190 tons, gymnasium addition to South Division High School; C. Hennecke Co., Milwaukee, low bidder.

RACINE, WIS., 225 tons, bridges for Highway 41 grade separation; J. R. Griffith Co., Racine, low bidder on complete contract.

CEDAR RAPIDS, IOWA, 700 tons, Post Office, J. P. Cullen & Son, Inc., Janesville, Wis., low bidder for construction.

CHICAGO, 2000 tons, Dvorak Junior High School; Vankerkott Structural Steel Co., low bidder.

CHICAGO, 300 tons, building for Sidney Wamser & Sons.

MARSEILLES, ILL., 600 tons, highway bridge.

CARMEL, ILL., 700 tons, highway bridge.

WAUSAU, WIS., 500 tons, highway bridge.

MISSOURI PACIFIC RAILROAD, 700 tons, bridge at St. Louis.

KANSAS CITY, MO., 300 tons, office building and airplane hangar.

Western States

SEATTLE, 1200 tons, approaches to University bridge.

LOS ANGELES, 625 tons, sheet metal piling for San Gabriel River outlet at Alamitos Bay.

UMATILLA COUNTY, ORE., 175 tons, two bridges on John Day highway in Umatilla National Forest for United States Bureau of Public Roads.

Canada

ASHCROFT, B. C., 500 tons, bridge; bids opened at Victoria Springs, Sept. 2.

ST. GREGOIRE DE MONTMORENCY, QUE., 700 tons, bridge over St. Lawrence River.

British Tariff for Revenue Postponed Until After General Election

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Belgian steel wages reduced, and German mills effect further curtailment of output.

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Two German mills exchange orders on shapes and rails to permit larger rollings.

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Indian company competes with Japanese and French for cast iron pipe export orders.

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Shanghai skyscraper of 24 stories planned by German steel company for offices.

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New German cruiser *Deutschland* driven by 56,000-hp. Diesel engines weighing 7½ lb. per hp.

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(*By Cable*)

LONDON, ENGLAND, Aug. 31.

THE British Government is understood to be working out drastic plans for economy although faced with formidable opposition from the trade unions. Meanwhile, British business has regained some confidence as a result of the stronger credit position of the country, but a genuine trade revival is considered to be still far in the future.

It is generally understood that a tariff for revenue has been definitely deferred until after the general election.

Conditions in Europe are unimproved. The wages of Belgian steel workers have been reduced 2.5 per cent, effective Sept. 1. In Germany, the Peiner and Mannesmann Rohrenwerke are closing further plant capacity and dismissing more men. The Baroper works is also suspending operations, and Ruhr mills are considering plans for suspension as rolling for stock is reaching a limit.

It has been suggested that the Ruhr steel industry might agree to close all plants simultaneously, or by rotation of individual groups. The Hoesch Steel Works and Gutehoffnungshütte are said to be experimenting in the exchange of orders for shapes and rails with a view to reducing costs by providing each mill with a sufficient rolling schedule on one product.

It is suggested in certain quarters that circumstances may necessitate extending this plan for exchange of orders to other Ruhr mills. The Daimler-Benz works has halved its working time to a 16-hr. week.

The German Foreign Office has protested to the Canton Government against boycott of German goods by that Government resulting from a dispute over a cargo of war materials.

In India, the Bengal Iron Co. has appeared as a competitor for cast iron pipe business, underquoting both Japanese and French pipe makers from new sales offices established at Singapore in the Federated Malay States, Bangkok in Siam and at Soerabaya, Dutch East Indies.

Negotiations are progressing between Saar mills and the French Merchant Bar Syndicate for a working agreement, and prospects for success are reported favorable.

German mills are opposed to offering finished steel products at the present price levels. French makers are actively competing for billet and sheet bar orders.

In the British market, the last hematite iron furnace of the North Lonsdale Iron & Steel Co. has been blown out. Shipyards are beginning to benefit by the recently developed plan of the steel mills providing a subsidy for builders agreeing to use domestic material exclusively.

Continental steel is being sold well below cost of production. German sheet bars have been sold to tin plate mills in South Wales at £3 10s. 6d. ($17.13) a ton, delivered, and at £2 18s. 6d. to £2 19s. ($14.22 to $14.34) a ton, f.o.b. Antwerp.

Welsh mills report increased inquiry for tin plate, but complain that prices are unprofitable. The mills are operating at about 50 per cent of capacity, but will be unable to maintain this schedule unless orders increase from European consumers. A feature of the present export market is the persistent buying by Japanese interests of 90-lb. and light tin plate wasters, regardless of sizes and quality.

Galvanized sheet prices have eased further, recently started mills having sold down to £8 13s. 9d. a ton (1.88c.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at $4.8665 (par)

British Prices, f.o.b. United Kingdom Ports

Ferromangarese, export	£9	0s.				$43.74		
Billets, open-hearth	4	17½	to	£5	5s.	23.69	to	$25.52
Black sheets, Japanese specifications	9	10	to	9	15	46.17	to	47.39
Tin plate, per base box	0	13¼	to	0	13½	3.22	to	3.28
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.71	to	1.81
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	2½	1.66	to	1.76
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	8	2½	to	8	7½	1.76	to	1.81
Galvanized sheets, No. 24 gage	8	17½	to	9	0	1.92	to	1.95

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2	6½s.	to	£2	7s.	$11.30	to	$11.42
Billets, Thomas	£2	18½s.				$14.09		
Wire rods, low C., No. 5 B.W.G.	4	15	to	5	0	23.09	to	24.30
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	3	5	to	3	7	0.71	to	0.73
Beams, Thomas, British standard (nominal)	3	5½	to	3	6	0.71	to	0.72
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	3	3	to	3	3½	0.69	to	0.70
Angles, Thomas, 3-in.	3	5	to	3	6	0.71	to	0.72
Hoops and strip steel over 6-in. base	4	2½				0.92		
Wire, plain, No. 8 gage	5	0	to	5	1¼	1.09	to	1.10
Wire, barbed, 4-pt. No. 12 B.W.G	8	10				1.87		

per lb.) and most mills freely offering to sell at £8 17s. 6d. (1.92c. per lb.).

Belgian production in July was 289,000 tons of pig iron and 278,000 tons of raw steel. Czechoslovakian output was 103,000 tons of pig iron and 111,000 tons of raw steel.

German output in July included 585,000 tons of rolled steel. Saar production was 121,000 tons of pig iron and 120,000 tons of raw steel.

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Light-Weight Diesel Engines in German Ship

HAMBURG, GERMANY, Aug. 22.—The new German battle cruiser Deutschland, which embodies many new features, will be driven by Diesel engines aggregating 56,000 hp., and weighing only 7½ lb. per hp. Built by the Maschinenfabrik-Augsburg-Nürnberg, there are four shafts, 48 cylinders, 18 in. in diameter, each developing 1160 hp. The light weight per horsepower is understood to have been made possible largely by wide use of welded construction. The Deutschland is expected to have a maximum speed of 26 to 26½ knots, and at a cruising speed of 20 knots will have a range of 10,500 miles without refueling.

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Casting of 78 Tons Made in Britain

LONDON, ENGLAND, Aug. 22.—One of seven large steel castings for the foundation of a 6600-ton forging press, built by Davy Brothers, Ltd., Sheffield, for the Soviet Union, weighs 78 tons. It comprises the main section of the base and measures 7 x 7 x 24 ft. Two ladles containing 97 tons of steel were required to cast it at the foundry of the English Steel Corpn. in Grimesthorpe, Sheffield.

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European Steel Tie Output Lower

HAMBURG, GERMANY, Aug. 22.—Production of steel railroad ties in European countries registered a decline in the first half of this year. United Kingdom output, which is always small, was only about 12,000 tons in the first half. Germany, which usually has an annual production of about 300,000 tons, made 105,000 tons in the first half, mostly for export; France only 31,000 tons, Belgium 19,360 tons, Austria, Hungary and Czechoslovakia, combined, only 21,300 tons and Poland 41,200 tons. About 85 per cent of the Polish output went to the Soviet Union. Italy made about 30,000 tons of steel ties in the first half, all for domestic use.

The heaviest steel ties are made in Germany, where the average weight is 172 lb. each, while the average in France is 130 lb. and in Belgium 125 lb. Recently there has been a fair volume of export business in steel ties to China, the Near East and South America. An order for 9000 tons placed by the South African railroads was distributed to Continental makers, German mills receiving 6500 tons. The current price on steel ties from German mills is about £8 2s. 6d. ($39.50) a ton, compared with £8 10s. ($41.32) a ton, quoted earlier this year.

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New American Licenses Acquired in Germany

HAMBURG, GERMANY, Aug. 22.—The Metallgesellschaft A. G., Frankfurt, a large importer of non-ferrous metals and manufacturer of finished products, has been licensed to use the Parker corrosion protection process for iron and steel. The Otto Junkers G.m.b.H. of Lammersdorf has been licensed for Europe to build sheet and strip shearing, cutting and straightening machinery under patents of the Hallden Machine Co., Thomaston, Conn.

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German Blast Furnaces Reduced to 157

HAMBURG, GERMANY, Aug. 22.—At the end of July the total number of blast furnaces in existence in Germany dropped to 157 from 160 in existence at the end of June, three having been scrapped during the month. It is noteworthy that at the end of July, 1930, there were 183 furnaces in existence, and in July, 1913, the total was 325. A further decline in the total is expected in September, as additional furnaces are scheduled for scrapping.

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Slight Gain in Iron Ore Imports

Imports of iron ore in July are reported by the Department of Commerce at 128,106 gross tons, an increase of 5 per cent over the June total of 121,892 tons, but otherwise the smallest month's figure since that of last February. Compared with a year ago the reduction has been about half.

In the seven-month period the total of 1,020,682 tons is only slightly over one-half of that for the same period in 1930.

Both in July and in the seven-month period Chile supplied a little more than one-half of all the imports. The percentage furnished by Chile is less than last year, but sufficient to retain first place. Second place in July was taken by Cuba which last year was not represented. Russia was third and Spain fourth, both being among the outsiders last year.

In the seven months Russia stands second, head and shoulders above any competitor except Chile; in fact, the next three added together would fail to equal the Russian tonnage. These three are French Africa, Cuba and Sweden. In contrast, Russia's total in the seven months of 1930 was less than 0.4 per cent of the aggregate imports.

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Sandberg Rail Treatment in Spain and Australia

LONDON, ENGLAND, Aug. 22.—Following extended trial of the Sandberg track process for treating rails, the tramways of Adelaide, Australia, have treated 32 miles of track in the busiest thoroughfares of the city. After similar tests, the tramways of Barcelona, Spain, have treated sections of the city railways, and plan treatment of an additional 17 miles of track to increase resistance to wear.

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Ocean Freights Reduced

HAMBURG, GERMANY, Aug. 22.—Effective Oct. 1, ocean freight rates on iron and steel from Continental ports to the United States are to be reduced by from 12.5 per cent to as much as 20 per cent.

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Plan Chinese Skyscraper

DÜSSELDORF, GERMANY, Aug. 20.—The Stahlunion G.m.b.H., export subsidiary of the Vereinigte Stahlwerke A. G., plans construction of a 24-story structural steel office building in Shanghai, China.

Sources of American Imports of Iron Ore
(In Gross Tons)

	July		Seven Months Ended July	
	1931	1930	1931	1930
Canada	2	83	204	236
Cuba	22,000	.....	56,000	190,654
Chile	65,944	151,211	550,409	1,153,965
Spain	9,550	.....	37,887	48,563
Sweden	6,538	29,740	43,761	141,906
French Africa	6,680	22,300	58,522	165,425
Russia	9,650	.....	190,659	6,771
Other countries	7,742	47,701	83,240	237,625
Total	128,106	251,035	1,020,682	1,945,145

PLANT EXPANSION AND EQUIPMENT BUYING

Chevrolet Orders Upward of $500,000

Further Buying by Automobile Trade Expected—Machine Tool Demand Otherwise Dull

ALTHOUGH machine tool manufacturers have been looking forward to a revival of buying interest in September, there is little evidence yet that the coming month will bring much of a change. August was dull throughout the country, and sales totals for the month for many manufacturers and dealers were the poorest for any month this year, and, in some instances, the smallest since 1921.

Some companies were helped out considerably by the orders placed by the Chevrolet Motor Co. for its transmission plant in Toledo, Ohio, these orders aggregating more than $500,000, the largest volume of machine tool business from one buyer in a long period. One of the orders was for 23 broaching machines, placed with the Oilgear Co., Milwaukee. Other orders covered lathes, grinders, drilling machines and a few vertical presses.

The City Machine & Tool Works, Dayton, Ohio, has received two orders from automobile manufacturers for 17 machines each. One order is for gear chamfering machines and the other is for gear chamfering machines and gear burnishers. These are among the largest orders ever placed for this type of equipment.

Automobile manufacturers are working on model changes and further business is expected to develop from that industry during the next month.

Some business that was looked for in August has not yet developed. Conspicuous among such prospects are about 50 machines for subway repair shops in New York and about 20 tools for the Brooklyn Navy Yard.

The small amount of business recently placed has caused some of the machine tool plants in Cincinnati to shut down for two weeks, while others will be idle during Labor Day week.

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NEW YORK

An order for 16 small lathes for New York public schools is the only order of importance reported during the past week. Machine tool dealers still await the award of 17 lathes and a few other tools for the Brooklyn Navy Yard, on which bids were taken some weeks ago, and are unable to account for the long delay, especially in view of the known interest of official Washington in helping business along. Awards are also pending on about 50 machines for subway repair shops in New York. Had these orders been placed in August, that month might have made a better record for some of the local machine tool houses, but as it happens the past month probably was the worst of the year and possibly the poorest for some since 1921. The outlook for September is by no means encouraging. About the only development of interest is that a few more inquiries are being quoted on.

CHICAGO

A survey of the machinery market in this district discloses August to have been one of the dullest months in the memory of local dealers. Some sellers report a slight pick-up in inquiries, but these are widely scattered and are usually for small and low-priced machines. An inquiry is out for a tool room lathe for the Austin High School, Chicago. The Northern Pacific has again postponed placing its requirements, presumably on account of absence of officials who are on vacations. It is reported that farm machinery manufacturers are redesigning some of their products and may need some new equipment. A sheet metal shop has ordered a No. 4 press. Several local shops have recently received orders to manufacture automobile parts.

MILWAUKEE

There is a general feeling in the machine tool trade that the end of the vacation season will witness definite improvement in the demand for equipment. Featuring business during the closing days of August was the placing of an order for 23 broaching machines by the Toledo plant of the Chevrolet Motor Co. with the Oilgear Co., Milwaukee. Other orders of lesser importance also are reported. There was a slight but encouraging increase in the number of inquiries, principally from automotive shops, and largely for tool room equipment.

CLEVELAND

Interest in the machinery market is centered in the purchase of equipment by the Chevrolet Motor Co. for its transmission plant in Toledo. Purchases are understood to aggregate over $200,000 and included broaching machines and presses, lathes, grinding and drilling machines. Except for this business the market continues dull with orders confined to single tools. Aside from a few single machines, no new inquiry has come out. Conditions in metal-working industries in this territory show little change, the only improvement reported being better operation by some of the smaller die shops.

CINCINNATI

The machine tool market is still extremely dull. Several plants have closed for two weeks and others are contemplating closing for the week of Labor Day. While a few orders for single tools have been received, there has been no buying movement which would warrant any change in plant operations. Inquiries the past week have slackened somewhat and many of those on which quotations have gone out are still awaiting improvement in general business. August, as a whole, was a trifle slower than July, largely because of vacations. Manufacturers, however, are looking forward to a revival of interest in September.

PITTSBURGH

While demand for machine tools showed no change during August, local dealers are still hopeful regarding the fall months. The passing of the Labor Day holiday will bring for-

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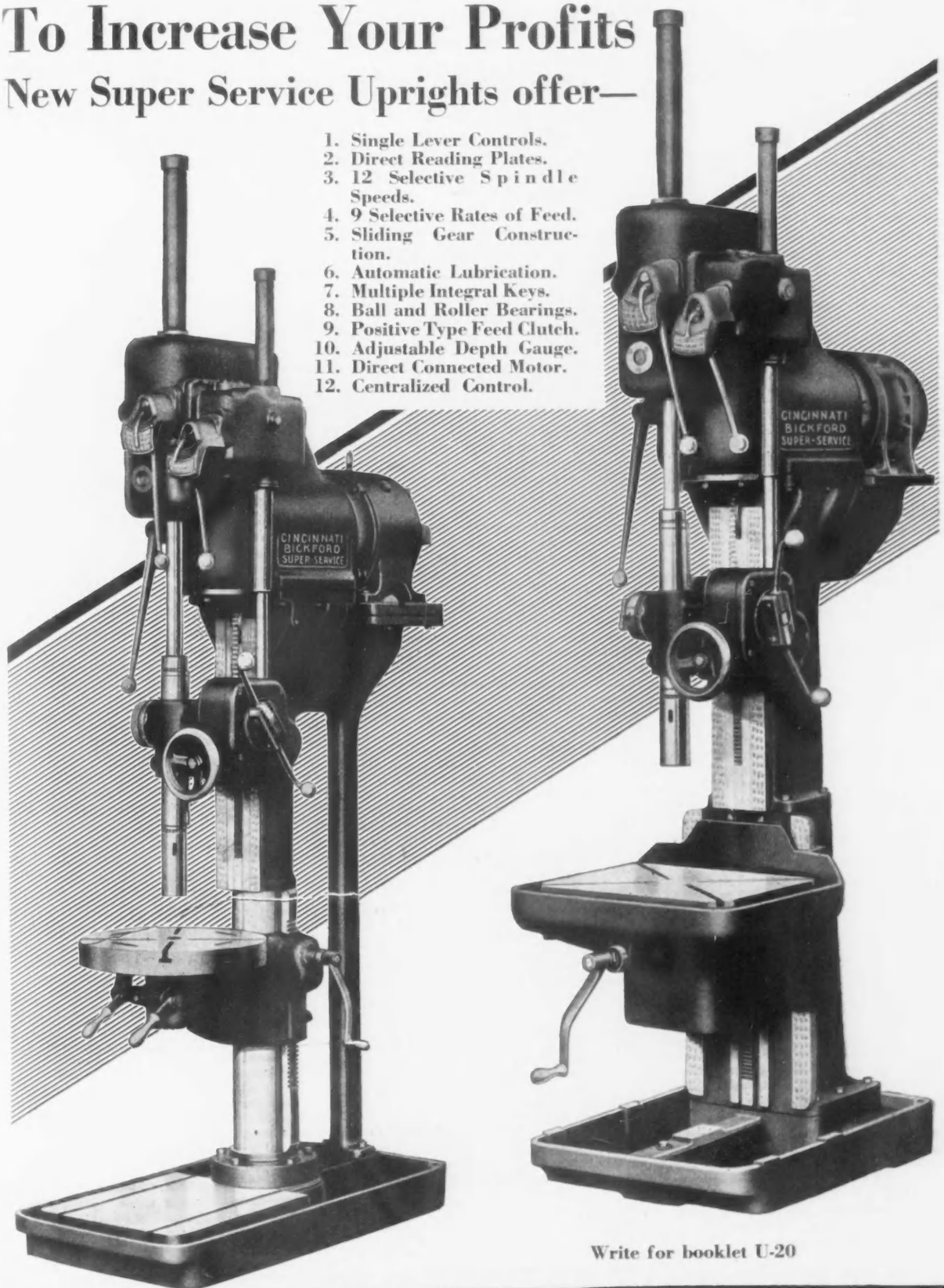

Write for booklet U-20

The Cincinnati Bickford Tool Company, Oakley, Cincinnati, Ohio

mal conclusion to the usual vacation period, making action possible on many purchases which have been delayed by the absence of executives. Improved inquiry may also follow, although new prospective business has been extremely limited in the last few weeks. Sales activity by leading dealers is being kept up at the same rate and some new business is being brought out from time to time.

The Norton Co., Worcester, Mass., will erect a small plant in Pittsburgh for which a few tools will be required later. No lists of importance are before the trade and none is promised in the near future. Buying by the railroads is still conspicuously absent.

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New York

PLANS have been filed by New York Central Railroad Co., 466 Lexington Avenue, New York, for seven-story storage and distributing terminal, 81 x 168 ft., at Washington, Gansevoort and Horatio Streets, to include elevating, conveying, loading and other equipment, to cost about $350,000. John B. Snook Sons, 52 Vesey Street, are architects.

Missisquoi Corpn., Sheldon Springs, Vt., manufacturer of cardboard and other heavy paper products, has purchased plant and business of Fonda Container Co., Utica, N. Y., manufacturer of cardboard and other paper containers. New owner will continue operations at present location and plans expansion later. H. E. Raymond, president and general manager of purchasing company, will occupy same position with Fonda company.

H. H. Bell Steel Co., Inc., New York, has been organized to manufacture iron, steel and other metal products, and will take over and expand H. H. Bell Co., 426 Greenwich Street, specializing in steel products.

Signal Supply Officer, Army Base, Brooklyn, is asking bids until Sept. 15 for 3000 to 9000 miles of wire and 3000 to 9000 reels; until Sept. 14 for 4000 toggle bolts, 36 saws and 24 trimmers, 44,000 insulators, 175 strain insulators, etc.; until Sept. 8 for 14 spreaders.

Department of Correction, Albany, N. Y., will receive bids on general contract until Sept. 4 for machine shop, forge and blacksmith shop, automobile service and garage building at Great Meadows State Prison, Comstock, N. Y.

Dumont Electric Corpn., 42 West Seventeenth Street, New York, has leased floor in building at 453-55 Broome Street for electric parts and equipment works.

Walter J. Williams, 208 Highland Boulevard, Brooklyn, and associates have organized Williams Automatic Preservator, Inc., with capital of $20,000, and plan operation of factory in Queens Borough for manufacture of complete refrigerating units, parts and other equipment. Frederick W. Williams, 9445 Eighty-sixth Road, Woodhaven, L. I., will be an official of organization.

Baird Television Corpn., 145 West Forty-fifth Street, New York, is planning establishment of new plant near city for manufacture of television receiving sets, including parts and assembling. Company is affiliated with Baird Television Co. of Great Britain, Ltd., London, which is now operating a plant for similar manufacture. Sydney A. Moseley, director of British company, is now in United States to arrange details of new plant.

In connection with acquisition of controlling interest in Transit Mixers, Inc., 1775 Broadway, New York, manufacturer of concrete mixing machinery, by Ransome Concrete Machinery Co., 445 West Twenty-sixth Street, manufacturer of kindred equipment, last noted company is arranging for production of Transit-type mixers, parts, etc., at plant at Dunellen, N. J., where manufacture of such units will be concentrated.

Velvet Tissue Products Co., Inc., Fulton, N. Y., care of William J. Hartnett, 258 North Fourth Street, recently organized by Mr. Hartnett and associates, has taken over former plant of Arrowhead Mills, Inc., Granby Center, near Fulton, for production of tissue and other paper stocks. Richard F. Baker, 306 Academy Street, Fulton, will be an official of company.

Board of Directors, Englewood School for Boys, Englewood, N. J., is considering erection of new school unit, to cost over $150,000 with mechanical and other equipment. Lawrence C. Light, 4 Dean Street, is architect.

Viking Tool & Machine Corpn., Newark, N. J., care of Osborne, Cornish & Scheck, 24 Commerce Street, attorneys, recently organized by Ervin Gibbs, Linden, N. J., and associates with capital of $50,000, plans operation of local factory for manufacture of tools and mechanical equipment, parts, etc.

George LaMonte & Son, Nutley, N. J., manufacturer of safety paper products, has awarded general contract to John W. Ferguson Co., Paterson, N. J., for two-story unit, 45 x 60 ft., one-story building, 30 x 100 ft., and second story on present one-story building, to cost over $75,000. Jardine, Murdock & Wright, 347 Madison Avenue, New York, are architects.

Culbert Pipe & Fittings Co., 180 Eighth Street, Jersey City, N. J., has asked bids on general contract for new one-story storage and distributing plant, 148 x 200 ft., with pipe-cutting, fitting and other departments, to cost over $45,000 with equipment. Mahnken & Schultz, 256 Summit Avenue, Union City, N. J., are architects.

Board of Education, West New York, N. J., is planning installation of a manual training department in connection with erection of two additional wings to school No. 3 and improvements in present school unit, to cost over $75,000. Frank J. Ricker, 685 Hudson Avenue, is architect.

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New England

BIDS have been asked on general contract by Arrow-Hart & Hegeman Electric Co., Hawthorn Street, Hartford, Conn., manufacturer of electric switches, sockets and other electrical equipment, for a one-story addition, 36 x 70 ft., to cost over $35,000 with equipment. Company will remove considerable heavy machinery from its Arrow plant to South works, and will install additional equipment. Mylchreest & Reynolds, 238 Palm Street, are architects and engineers.

Chester Granite & Polishing Co., Chester, Mass., is planning to rebuild part of plant recently destroyed by fire, with loss reported more than $75,000 including machinery.

George R. Hobbs, 16 New Street, East Boston, manufacturer of wire-bound and other boxes and cases, has leased over 25,000 sq. ft. floor space in plant on Eastern Avenue, Chelsea, Mass., for new branch plant. Company has also taken option on 25,000 sq. ft. additional space and plans removal of East Boston works to new location later.

Haro Co., Inc., Bridgeport, Conn., recently organized by P. S. Hardy, 221 Burritt Avenue, Stratford, Conn., and associates, plans operation of factory at first noted place for manufacture of aluminum and other metal goods. Harry A. Roraback, 150 Rocton Avenue, Bridgeport, is interested in company.

Boston Elevated Railway, 31 St. James Avenue, Boston, has plans for one-story addition to motor bus service, repair and garage building, 65 x 150 ft. A. J. Blackburn, address noted, is company architect.

School Committee, Cambridge, Mass., has engaged Ralph Harrington Doane, 60 Batterymarch Street, Boston, architect, to prepare plans for addition to Rindge Technical High School, to cost about $1,200,000, of which approximately $250,000 will be expended for equipment for mechanical shops, laboratories, etc. Units will include a complete aircraft shop and automobile repair division.

D. Macaulay, 436 Atlantic Avenue, Boston, operating a general machine and forge shop, has awarded general contract to F. Leroy Fox, 15 Exchange Street, for one-story addition, to cost about $25,000 with equipment.

Connecticut Light & Power Co., Hartford, Conn., operated by Connecticut Electric Service Co., same address, is arranging for an increase in capital of about $20,000,000, part of proceeds to be used for expansion and improvements, including acquisition of Waterbury Gas Light Co., Waterbury, Conn., Winsted Gas Co., Winsted, Conn., and other properties.

Wareham Mfg. Co., Inc., Wareham, Mass., manufacturer of horse shoes, is building an addition to its South Wareham factory and making other improvements.

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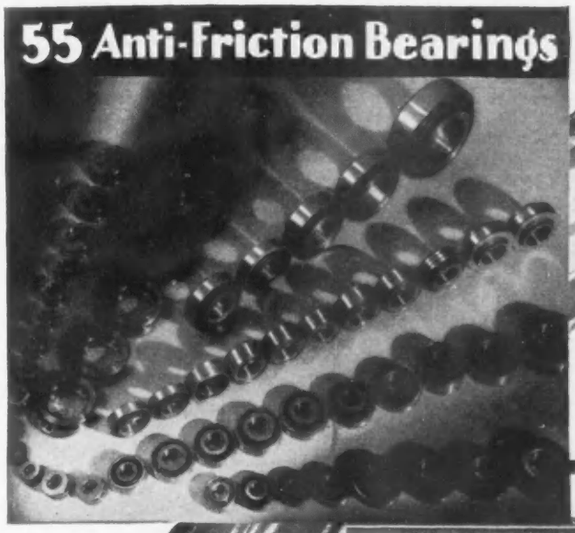
Pittsburgh

BIDS will soon be asked by City Council, Ford City, Pa., for a municipal electric light and power plant, including a 500-hp. Diesel engine unit with accessory equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

A. A. Hoffman, Jr., 67 South Jackson Street, Belleview, Pa., and associates have organized Pennsylvania Oil Specialties Co., Butler, Pa., and plan operation of oil compounding and refining plant at last noted place. Mr. Hoffman will be treasurer. F. G. West, 520 North Monroe Street, Butler, is interested in new company.

Ashland Refining Co., Ashland, Ky., operating oil refineries, pipe lines, etc., is arranging for purchase of plant and property of Cumberland Pipe Line Co., Oil City, Pa., and will consolidate. Purchasing company plans expansion and betterments, including pipe line construction, etc.

Harvey Paper Mills Co., Wellsburg, W. Va., manufacturer of heavy paper products, a subsidiary of Pillsbury Flour Mills Co., Minneapolis, Minn., has asked bids on general contract for two-story



MONARCH ANNOUNCES A BETTER 13" TOOL ROOM LATHE

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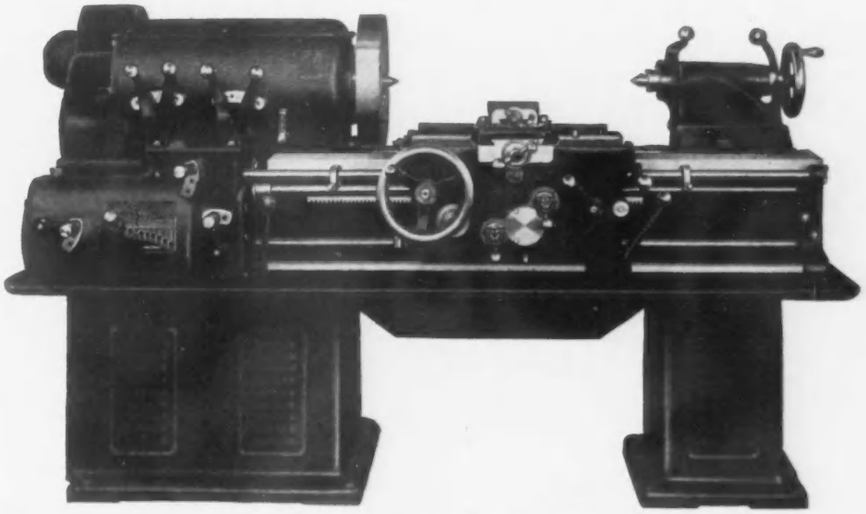
9—Anti-friction bearings throughout—55 in all. They eliminate wear and give unusual accuracy—enabling the operator to set the limits as close as he desires.
10—Improved lubrication. Headstock is oiled once each year, quick-change gear box oiled once a week, apron oiled weekly.

Bulletin 143 gives the facts. Write for a copy.



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addition to mill, 35 x 70 ft., to cost close to $40,000 including machinery.

Department of Public Works, Pittsburgh, Edward G. Lang, director, will soon break ground for new municipal electric-operated pumping plant at Brilliant, to cost $900,000 with electric power and other machinery. It will replace a present steam-operated station.

Winifrede Collieries, Inc., Winifrede, W. Va., has approved plans for expansion and improvements in coal tipple at local mining properties, changing unit from two to four tracks, with installation of shaker screens and other equipment, hoisting machinery, conveying apparatus, etc.

Emblem Oil Co., Warren, Pa., a subsidiary of United Refining Co., has plans for new bulk oil storage and distributing plant at Erie, Pa., to cost close to $50,000 with equipment. Company has work under way on addition to plant at Warren, to cost over $325,000 with machinery.

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Buffalo

WHARF and adjoining property of Erie Railroad Co., Dunkirk, N. Y., have been acquired by Standard Oil Co. of New York, 26 Broadway, New York, for new bulk oil storage and distributing plant, for marine, rail and motor truck service, to cost over $250,000 with equipment.

Harry C. and Julius R. Gilbert, 380 Yarmouth Road, Rochester, N. Y., have organized Gilbert Utilities Corpn. to operate a local plant for manufacture of domestic furnaces, boilers, etc. J. Wesley Rose, 59 McKinster Street, is interested in organization.

Allegheny Refineries, Inc., Bolivar, N. Y., Wallace E. Sawyer, president, recently organized by Mr. Sawyer and associates with capital of $500,000, will defer erection of new oil refinery near Bolivar until late in present year. Plant will cost over $250,000 with machinery. Herbert Ross, Warren, Pa., is consulting engineer.

Board of Education, Auburn, N. Y., plans installation of manual training equipment in new multi-story senior high school to cost over $550,000 for which general contract has been let to Mathew Rauen, 326 West Madison Street, Chicago. Hillger & Beardsley, Auburn, are architects.

Merrill Terreberry, 57 Berwyn Street, Buffalo, has organized General Welding & Machine Co. to operate a local machine repair and welding works.

Sodus Canning Co., Inc., Sodus, N. Y., recently organized by Frank D. and Dwight F. Gaylord, Sodus, with capital of $100,000, is planning erection of new fruit and vegetable canning plant, to cost over $50,000 with automatic canning, conveying and other equipment.

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Cleveland

PLANS have been filed by Morse-Rogers Steel Co., 1515 Fairfield Street, Cleveland, for a one-story addition, 30 x 85 ft.

Firestone Tire & Rubber Co., Akron, Ohio, has plans for a three-story factory branch, service and distributing plant at Chicago, to cost over $300,000 with equipment.

Andrews Spray Equipment Co., Cleveland, care of John H. Smart, 308 Euclid Avenue, recently organized by Mr. Smart and associates, plans operation of local factory for manufacture of spraying equipment. Frank E. Budna is interested in new company.

International Harvester Co., 606 South Michigan Avenue, Chicago, has awarded general contract to A. Bentley & Son Co., 201 Belmont Avenue, Toledo, Ohio, for one and two-story factory branch, storage, distributing and service building for motor truck division, 160 x 176 ft., and 175 x 214 ft., at Toledo, to cost about $150,000 with equipment.

City Ice & Fuel Co., 6611 Euclid Avenue, Cleveland, has approved plans for a new one-story ice-manufacturing and refrigerating plant, 100 x 250 ft., at Boston, to cost over $75,000 with machinery.

Standard Oil Co. of Ohio, Midland Bank Building, Cleveland, has purchased Solar Refining Co., Lima, Ohio, operating a local oil refinery with capacity of 10,000 bbl. a day, and will consolidate. Purchasing company will continue Lima refinery and contemplates expansion.

Napoleon Hoop Co., Napoleon, Ohio, manufacturer of steel hoops, etc., plans rebuilding of part of mill recently destroyed by fire.

Lakewood Engineering Co., Cleveland, has sold Industrial Division of its business to Easton Car & Construction Co., Easton, Pa. Hereafter line of Lakewood tier trucks, electric trucks, trailers, skids and industrial cars will be manufactured at Easton.

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Chicago

SANITARY District of Chicago, room 600, 910 South Michigan Avenue, Chicago, will receive bids until Sept. 10 for one electric-operated centrifugal type sludge dehydrating machine, with capacity of at least 100 gal. a min. James J. Sullivan is clerk.

American Manganese Steel Co., 333 North Michigan Avenue, Chicago, has purchased plant at Welland, Ont., on 11 acre tract, previously used as an electro-metallurgical works and idle for several years. Main unit is one story, 80 x 500 ft. Purchasing company is organizing a Canadian subsidiary to occupy plant for production of manganese steel castings, special alloy castings, machine parts, etc. Company will abandon plans for new plant near Montreal, recently reported, concentrating Canadian production at Welland.

H. W. Austin, State Commissioner of Purchases, State Capitol Building, St. Paul, Minn., is asking bids until Sept. 10 for steel water tank and tower, four stokers and one air compressor for State public school at Owatonna. Edwin F. Jones, 116 East Fourth Street, St. Paul, is mechanical engineer.

Interstate Power Co., Dubuque, Iowa, has arranged for a bond issue of $5,000,000, part of proceeds to be used for expansion and improvements in properties. Company is a unit of Utilities Power & Light Corpn., 327 South La Salle Street, Chicago.

American Airways, Inc., Lambert Field, Robertson, Mo., has plans for a one-story hangar, 160 x 200 ft., with reconditioning and repair facilities at airport at Chicago, to cost close to $100,000 with equipment. Hoener, Baum & Froese, 3605 Laclede Avenue, St. Louis, are architects.

City Council, Northwood, N. D., has been authorized to arrange bond issue for extensions and improvements in municipal electric light and power plant and system, including installation of additional equipment.

Town Council, Bellevue, Iowa, is asking bids until Sept. 10, for one-story addition, 40 x 60 ft., to municipal electric light and power plant, and installation of additional equipment. Lester J. Gaylor is town clerk.

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Philadelphia

LEASE of one-story building at 2226-28 Arch Street, Philadelphia, has been arranged by National Battery Co., St. Paul, Minn., manufacturer of electric storage batteries, for new factory branch, service and distributing plant.

Automatic machinery, conveying and other equipment, drying apparatus, etc., will be installed in new six-story and basement factory to be erected by Consolidated Cigar Corpn., 619 Moore Street, Philadelphia, to cost over $100,000 with equipment. Julian S. Simsohn, 933 North Broad Street, is architect and engineer.

Globe Metal Mfg. Co., Philadelphia, has been organized with capital of $75,000, to take over and expand company of same name, with plant at 1932 East Letterly Street. James Pressman will head new organization, which will specialize in production of electrical fixtures and appliances.

Standard Oil Co. of New Jersey, 26 Broadway, New York, has purchased 11-acre tract at East Burlington, N. J., for new bulk oil storage and distributing plant. Plans have been drawn for four main units to cost over $80,000 with equipment. New works will replace present plant at West Burlington, where site has been taken over by Public Service Electric & Gas Corpn., Newark, N. J., for addition to power plant to cost over $1,000,000.

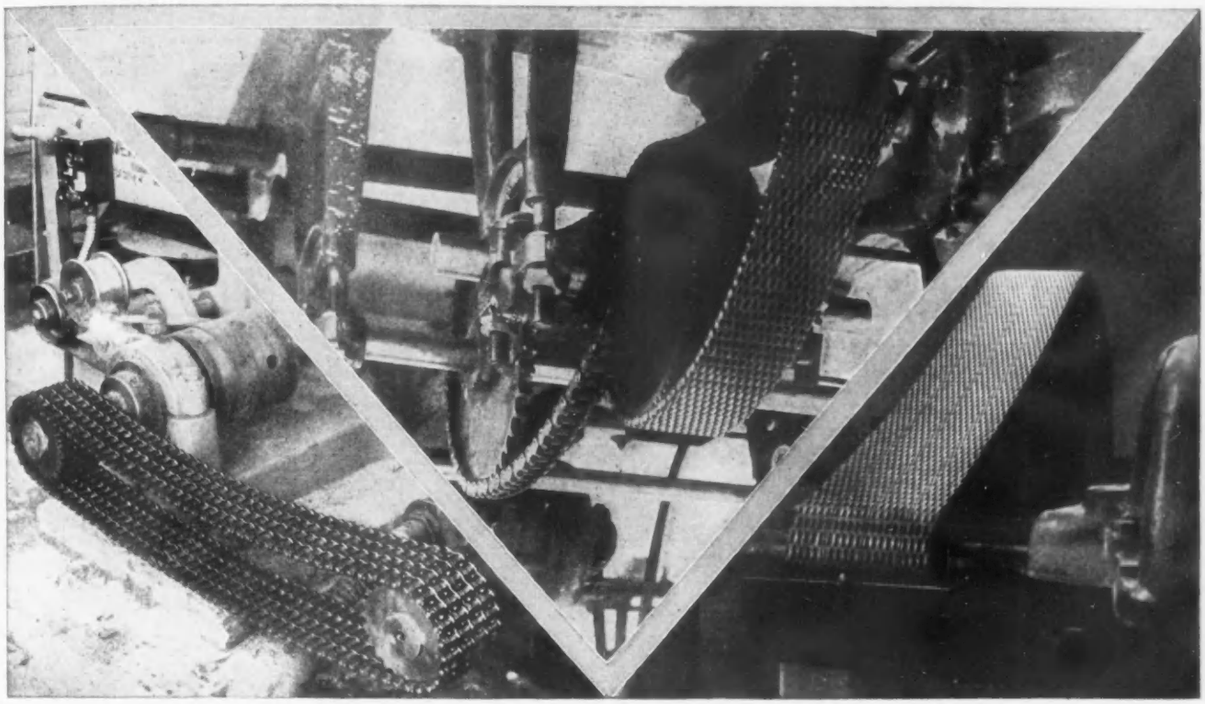
Bureau of Supplies and Accounts, Navy Department, Philadelphia and Washington, is asking bids until Sept. 15 for 100 hand fuel pumps for Philadelphia navy yard; until Sept. 8 for 250 pressure lubricating guns for same yard.

Board of Education, Wilmington, Del., plans installation of manual training equipment in new local high school to replace present old school at Delaware Avenue and Adams Street, to cost over $500,000. Committee has been appointed to make report on project, headed by A. B. Anderson, director of vocational education for Board.

Scranton-Spring Brook Water Co., Scranton, Pa., has arranged for a bond issue to total $1,650,000 and note issue of $1,500,000, part of proceeds to be used for expansion and improvements in waterworks and system, including pumping machinery and power equipment.

L. F. Seyfert's Sons, Inc., 437 North Third Street, Philadelphia, manufacturer of machinery and parts, has taken over Monarch Machinery Co., 300 North Third Street. Machine tool departments of both companies will be merged, with E. W. Stegman in charge.

Community Radio, Inc., Williamsport, Pa., care of C. R. Cummins, Williamsport, now being organized by Mr. Cummins and associates, has applied for permission to build and operate broadcasting stations in 267 cities and towns in different States, to include power sta-



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WHITNEY CHAIN DRIVES

tions, towers and other operating equipment.

State Board of Education, Dover, Del., is considering installation of manual training department in new two-story and basement school at Marshalltown to cost over $175,000, for which general contract has been let to R. S. Herzog, 19 South Eighteenth Street, Philadelphia. Guilbert & Betelle, 20 Branford Place, Newark, N. J., are architects.

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St. Louis

CITY COUNCIL, Hominy, Okla., is arranging early sale of a bond issue of $150,000, fund to be used for erection of a municipal electric light and power plant.

Board of Public Works, Kansas City, Mo., M. S. Murray, director, has asked bids on general contract for a new hangar and shop building at municipal airport, one story, 172 x 490 ft., to cost about $250,000 with equipment. Alonzo H. Gentry, Inc., 109 West Eleventh Street, is architect.

Corona Silica Products Co., Rogers, Ark., care of H. R. McKnight, Rogers, recently organized by Mr. McKnight and associates, has leased over 300 acres of silica and rutile properties in Magnet Cove district, near Hot Springs National Park, Ark., and plans installation of mining and ore-concentrating plant to cost over $75,000 with machinery. Loading, conveying and other equipment will be installed.

State Board of Affairs, State Capitol Building, Oklahoma City, Okla., has awarded general contract to G. C. Frier, Sulphur, Okla., for three-story and basement vocational building at State School for Deaf, Sulphur, 55 x 128 ft., to cost close to $100,000 with equipment. Layton, Hicks & Forsyth, Braniff Building, Oklahoma City, are architects.

Maney Milling Co., 2436 South Twenty-seventh Avenue, Omaha, Neb., has awarded general contract to Fogles Construction Co., Wesley Temple, Minneapolis, for addition to grain elevator, including elevating, conveying, screening and other equipment, to cost over $75,000.

Board of Education of St. Louis opened bids Sept. 2 for machine shop equipment for Herbert S. Hadley Vocational School, including about 50 machines. Bids originally were advertised to be received on July 8, but because of a legal technicality new bids were called.

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Gulf States

PLANS are being arranged by Kimball Milling Co., Forth Worth, Tex., Kay Kimball, president, for new three-story and basement plant at Sherman, Tex., with elevating, conveying, screening and other equipment, to cost over $40,000 with machinery. Company recently acquired plant of Diamond Mill Co., Sherman, and will consolidate.

Tangipahoa Parish School Board, Amite, La., plans installation of manual training equipment in new two-story high school at Kentwood, La., to cost about $125,000, for which Favrot & Livaudais, Hibernia Bank Building, New Orleans, are architects.

Phillips Petroleum Co., Borger, Tex., is planning to rebuild part of oil refinery recently destroyed by fire, with loss over $75,000 including equipment. Headquarters are at Bartlesville, Okla.

P. R. McCrary, head of McCrary Engineering Co., Jacksonville, Fla., is organizing new company to establish a plant near Jacksonville for manufacture of a mechanical cultivator and single-wheel plow, known as McCrary's Mechanical Mule, including parts production and assembling. Unit is now being manufactured at York, Pa. Mr. McCrary has formed Federal Farm Equipment Co., 17 Broad Street Viaduct, Jacksonville, as selling organization.

Gulf States Utilities Co., Beaumont, Tex., has authorized construction of a transmission line for dredging and other service from Sabine Lake to Jefferson-Galveston County line, about 28 miles, to cost over $50,000 with power-switching station and other equipment.

William C. Hickey, Poteet, Tex., and associates have organized Hickey Plow Mfg. Co., and plan operation of local works for manufacture of plows and other agricultural implements.

Harold English, Amarillo, Tex., has begun erection of a one-story machine shop, 50 x 140 ft., to cost close to $21,000 with machinery. Bery & Hatch, Oliver Eakle Building, are architects.

Texas Citrus Fruit Growers' Exchange, Mission, Tex., has awarded general contract to W. A. Velten, Brownsville, Tex., for a new fruit-packing plant at Harlingen, Tex., to cost about $80,000, of which more than $30,000 will be expended for mechanical-packing, conveying, handling and other equipment. Contractor has award for a similar packing plant for same interests at San Carlos, Tex., to cost about $75,000.

Southern Kraft Corpn., Panama City, Fla., has begun superstructure for two one-story buildings at local paper mill, totaling 60,000 sq. ft. and 30,000 sq. ft., respectively, primarily for storage and distribution, to cost over $60,000 with equipment. Company is a subsidiary of International Paper Co., 100 East Forty-second Street, New York.

Prairie Oil & Gas Co., Independence, Kan., plans erection of bulk oil storage and distributing plant on portion of 534-acre tract near Kilgore, Tex., recently acquired, to cost over $75,000 with equipment.

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Cincinnati

CITY COUNCIL, Piqua, Ohio, is arranging for a bond issue of $810,000, to be submitted for approval at November election, fund to be used for a municipal electric light and power plant. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

William G. Rehn & Sons, 454 Bank Street, Cincinnati, meat packers, have asked bids on general contract for a one and two-story and basement addition to plant, installation to include a refrigerating plant and system, mechanical conveyor and other handling equipment, to cost over $60,000. John J. Wilkens, 1107 Bates Avenue, is architect.

Contracting Officer, Wright Field, Dayton, Ohio, is asking bids until Sept. 8 for 450 oleo strut fairing assemblies; until Sept. 9 for three dynamometer radiators and three radiator stands; until Sept. 14 for one electric-operated universal glue jointer, including motor; one 200-hp. electric motor, one 30-in. motor-driven automatic knife grinder, 110 oxygen type regulators, 700 fuel pressure gages and 1800 oil pressure gages; until Sept. 15 for two electric operated portable cleaning machines, two motor-driven lathes, 200 ammeter assemblies and 850 voltmeter assemblies; until Sept. 16 for 100 mount assemblies, ring-type.

Columbia Gas & Electric Corpn., 61 Broadway, New York, has purchased oil and gas properties of Kentucky By-products Coal Co., aggregating over 31,700 acres in Lawrence, Floyd and Martin Counties, Ky., and will consolidate with its other interests in Kentucky fields. Purchasing company plans development for natural gas supply, including pipe lines and compressor plants.

City Council, Mount Sterling, Ky., has received report regarding installation of municipal electric light and power plant from Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., consulting engineer, and is expected to take favorable action soon. Project will cost over $85,000.

Stoll Oil Co., Elizabethtown, Ky., George Stoll, head, is considering erection of new bulk oil storage and distributing plant at Greensburg, Ky., to cost over $40,000 with equipment. Plant will be operated under direction of Green County Oil Service Co., now being organized by Harold Gorin and Robert White, both of Greensburg.

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South Atlantic

PUBLIC IMPROVEMENT COMMISSION, City Hall, Baltimore, plans installation of manual training equipment in new three-story junior high school to cost over $750,000, for which bids will be asked on general contract in fall. H. J. Leimbach is supervising engineer. Wyatt & Nolting, Keyser Building, are architects.

Board of District Commissioners, District Building, Washington, is asking bids until Sept. 9 for four motor-driven road graders.

Williams-Norris Co., High Point, N. C., manufacturer of furniture, has acquired former plant of Premier Furniture Mfg. Co., and will remodel for production of dining room and other furniture. Electric-operated machinery will be installed.

Augusta Canal Co., Augusta, Ga., has plans for new hydroelectric generating plant, to cost close to $1,000,000 with transmission system, and will begin work soon. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Chemical Warfare Service, Edgewood Arsenal, Md., is asking bids until Sept. 8 for 49,995 ft. of sheet brass, quantity of sheet zinc, etc.

Dixie Terminal Co., Atlanta National Bank Building, Atlanta, Ga., is arranging early erection of nine-story warehouse terminal, to include cold storage and refrigerating division, with electric-operated machinery. Installation will include elevating, conveying, loading and other equipment. Plant will cost close to $1,000,000 complete. A. Epstein, 2001 West Pershing Road, Chicago, is mechanical engineer.

Charles J. Phillips, 1336 Greenmount Avenue, Baltimore, operating a machine

Schiess-Defries

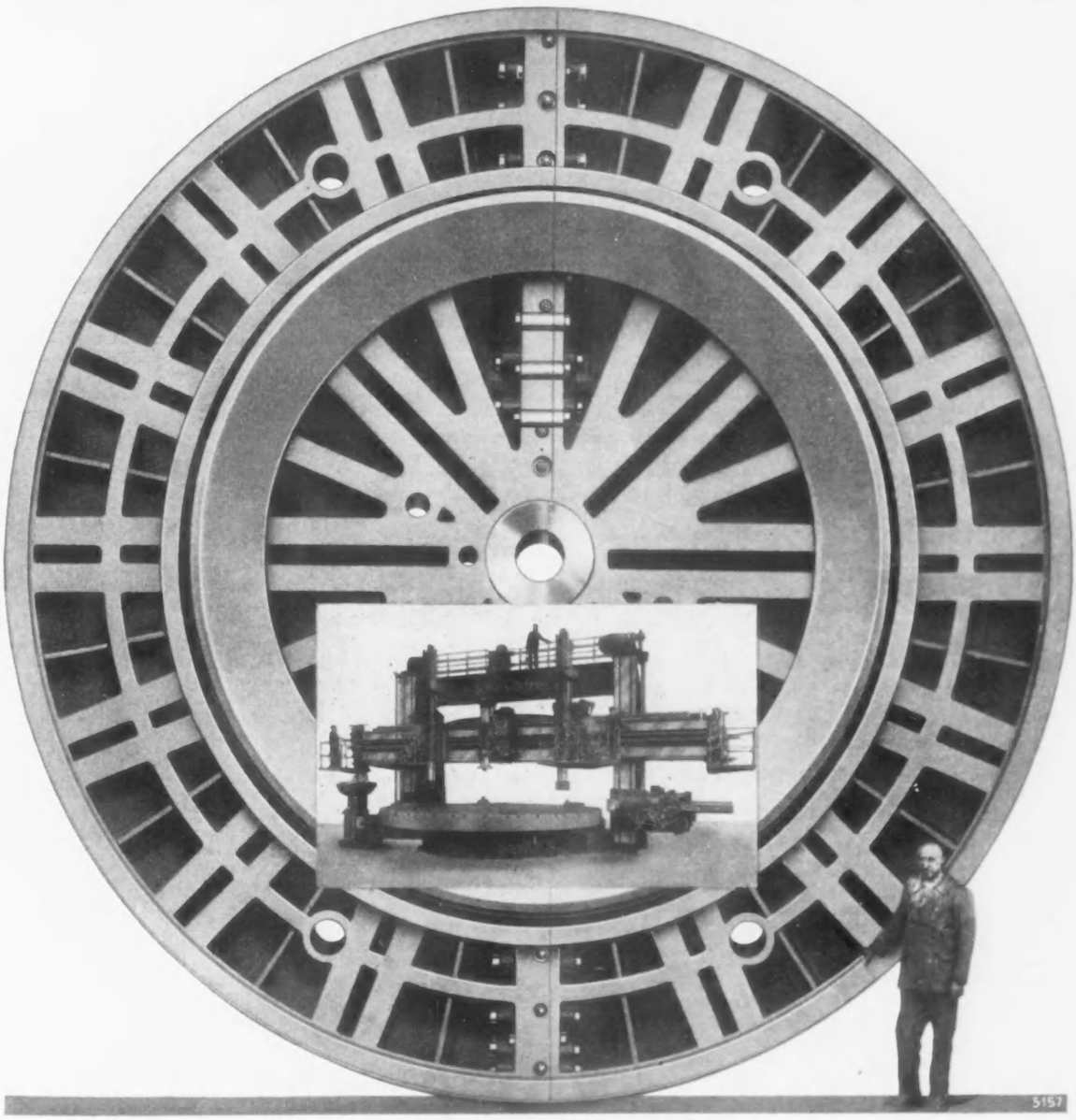

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Illustration: Table of Large Vertical Boring Mill.

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Germany

and tool works, has awarded general contract to C. E. Parsley, 1536 North Gay Street, for a two-story machine shop, 86 x 95 ft., to cost over $20,000 with equipment.

Colonel Clay Davis, head of John H. Davis & Son, Toccoa, Ga., attorneys, is interested in a project to erect a hydro-electric generating plant in that vicinity, initial unit to cost over $5,000,000 including power dam and transmission lines. Company will be organized to carry out development.

Georgia Forestry Association, Atlanta, Ga., T. Guy Woolford, president, in cooperation with recently established State Department of Forestry and Geological Development, State House, Atlanta, have plans for new semi-commercial paper and pulp mill for production of newsprint, to cost $70,000. Legislature has granted $20,000 of fund noted and Chemical Foundation, Inc., 654 Madison Avenue, New York, $50,000.

Quartermaster, Marine Corps, Washington, will receive bids until Sept. 8 for four portable electric generator units, also for 5000 ft. copper wire.

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Milwaukee

NEW bids are being taken until Sept. 15 by Board of Public Works, Racine, Wis., for construction and equipment of new municipal sewage treatment plant to cost $660,000. Bids on first invitation were rejected as exceeding appropriation. Engineers are Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago. Henry A. Nelson is commissioner of public works.

Edward E. Gillen Co., 626 East Wisconsin Avenue, Milwaukee, marine contractor, has received two contracts aggregating $957,000 from Milwaukee sewerage and harbor commissions for construction work on outer harbor project. Work includes building 3827 lin. ft. of bulkhead, dredging and filling, and construction of first slips and piers.

Milwaukee Electric Railway & Light Co., 231 West Michigan Street, Milwaukee, is taking bids until Sept. 3 for a brick and tile manufacturing plant at Port Washington, Wis., in connection with demolition of claybanks for site of $20,000,000 steam generating plant on Lake Michigan. Fred A. Luber is architectural engineer.

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Detroit

PLANS have been completed by Murray Corpn. of America, Ecorse, Mich., manufacturer of automobile bodies, metal stampings, etc., for two one-story additions, 80 x 260 ft., and 60 x 160 ft., primarily for production of heavy metal stampings, to cost over $100,000 with machinery. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Packard Motor Car Co., 1580 East Grand Boulevard, Detroit, has acquired a plant at Windsor, Ont., for a new branch assembling plant for Canadian trade. Initial works will cost over $100,000 with equipment.

International Radio Corpn., Ann Arbor, Mich., recently organized with capital of $50,000, has taken over former four-story factory of Arborphone Co., West William and Fourth Streets, for manufacture of new type of radio receiving sets, parts, etc. Charles A. Verschoor is president of new company; Earl Cress, vice-president and secretary.

Henry A. Strouse, 5120 Baldwin Avenue, Detroit, and associates have organized Chromed Screw Corpn., with capital of $10,000, and plan operation of factory for manufacture of chromium-plated nuts, screws, bolts and kindred products. Webster B. Knight, Detroit, will be one of heads of new company.

Alpena Gravel Co., Alpena, Mich., is considering erection of a new sand and gravel plant at Millersburgh, including mining, conveying, loading and other equipment, to cost over $50,000.

C. A. Newcomb, Jr., 1700 Penobscot Building, Detroit, and associates have organized Radium Corpn. of Canada, Ltd., with capital of $10,000,000, to operate mineral properties in Great Bear Lake district, Province of Quebec. Company plans installation of equipment for production of radium, uranium, copper, silver and kindred minerals, including mechanical washing, conveying and other machinery. Mr. Newcomb will be president.

Michigan Seating Co., Jackson, Mich., manufacturer of fibre and other seats, has purchased former local factory of Schmidt Chemical Co. for new plant and will remove to new location.

International Lock & Products Co., Inc., 439 East Fort Street, Detroit, recently organized, plans operation of local factory for manufacture of locks, locking devices and kindred specialties. Reuben Simon, 16544 Roselawn Avenue, is one of heads of company.

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Indiana

BOARD of City Commissioners, Crown Point, contemplates early call for bids for a municipal electric lighting plant, with Diesel engine unit, to cost over $75,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, is planning extensions and improvements in oil refinery at Whiting, Ind., to cost over $1,500,000 with machinery.

George Weston, head of Weston Paper & Mfg. Co., Dayton, Ohio, has acquired plant and property of Bedell Mfg. Co., Marion, Ind., and contemplates remodeling for branch paper manufacturing unit.

Harry L. Stark, Fort Wayne, and associates have organized Stark Sound Engineering Corpn., with capital of $25,000 and 250 shares of stock, no par value, to operate a local plant for manufacture of sound devices and equipment. Benjamin W. Boyer, Fort Wayne, is interested in company.

Public Service Co. of Indiana, Indianapolis, has applied for permission to issue notes in amount of $5,000,000, part of fund to be used for extensions and improvements in plants and system.

Commercial Electric & Mfg. Co., Indianapolis, recently organized, has leased property at 424 South Meridian Street and will establish new plant for manufacture of electrical and gas cooking appliances and equipment. A department will also be operated for metal stamping. J. C. Jordan is president.

Public auction sale of machinery and equipment of Jenkins Vulcan Spring Co., Richmond, will be held on Sept. 15 by Industrial Plants Corpn., Columbus, Ohio.

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Pacific Coast

CONTRACT has been let by Fraser Furnace Co., 445 South San Joaquin Street, Stockton, Cal., manufacturer of furnaces, heaters, parts, etc., to Fay Zinck, 2034 North Pacific Avenue, for a new one-story plant, 110 x 150 ft., to cost about $60,000 with equipment. Frank Mayo, 1024 West Flora Street, is architect.

California Spray-Chemical Corpn., Berkeley, Cal., has been organized to take over and expand California Spray-Chemical Co., same place, manufacturer of spraying equipment, with plants at Richmond and Watsonville, Cal. Standard Oil Co. of California, 225 Bush Street, San Francisco, is interested in new company, and will be represented on board of directors. Officials of company will include E. E. Luther and R. K. Vickery.

Schofield Automotive Engineering Co., Anaheim, Cal., has plans for new two-story plant for manufacture of automobile equipment, to cost close to $40,000 with machinery. Aleck Curlett, Union Bank Building, Los Angeles, is architect.

San Jose Meat Co., Berryessa Road, San Jose, Cal., is planning to rebuild part of meat-packing plant recently destroyed by fire, with loss of about $75,000 including equipment.

Vallejo High School District, Vallejo, Cal., contemplates installation of a vocational training shop in connection with a new high school group to cost $230,000. A bond issue in that amount is being arranged. Davis-Pearce Co., Builders' Building, Stockton, Cal., is architect.

Portland Battery Mfg. Co., East Seventeenth and Tacoma Streets, Portland, Ore., manufacturer of electric storage batteries, battery plates, etc., has plans for a new one-story factory, 100 x 500 ft., to cost over $100,000 with equipment. J. W. DeYoung, 350 Salmon Street, is architect.

National Steel Construction Co., Seattle, is planning to rebuild part of iron and steel works recently destroyed by fire, with loss over $75,000 including equipment.

Stauffer Chemical Co., Rives-Strong Building, Los Angeles, manufacturer of industrial chemicals, will soon take bids on general contract for a new one-story plant, 100 x 160 ft., near Del Amo, Dominguez district, to cost close to $70,000 with equipment.

Mountain Lumber Co., Tacoma, Wash., Roy J. Sharp, manager, has plans for a new one-story sawmill to cost about $50,000, with electric-operated and other machinery, to replace a unit recently destroyed by fire.

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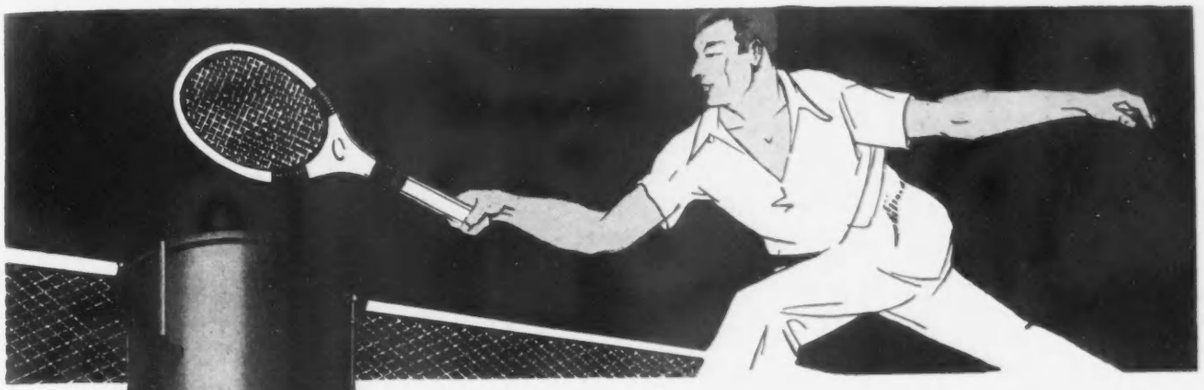
Canada

BIDS will be received by W. H. Heaton, comptroller, Sammon Avenue, East York Township, until Sept. 8, for construction of a pumping station and equipment. G. R. Jacks is commissioner of works.

City Council, Montreal, contemplates building duplicate pumping plant at foot



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Business as Others See It

Digest of Current Financial and Economic Opinion

CONTINUED failure to adjust prices so that raw materials and finished products are in some sort of normal relation to each other, together with the poor adjustment of supply to demand in many lines, is held by numerous observers to be standing squarely across our path to emergence from the current and over-lengthy depression.

Some still point to Europe, the Orient and Latin America as the localities where improvement must take place first, thus releasing export markets for our industrial plants. But Mark Sullivan, in New York *Herald Tribune*, scouts that idea as wholly fallacious. "As respects trade," he says, "the whole world outside the United States could sink into the seven seas, and the normal state of business in the United States would be almost 'as usual.' We should have a slightly less volume of business than normal, but we should have more than we have today. The total of all our foreign business is less than 7 per cent of what we do among ourselves. The total profit we make on all our foreign trade is less than 2 per cent of our annual income."

But that prices are out of joint seems to be commonly agreed—prices of labor as well as prices of commodities. Referring to the railroads, *Annalist* says: "Whether we like it or not, a reduction in labor costs appears to be the only avenue left by which anything permanent can be accomplished, either for the purpose of restoring confidence in the railroads or, in the long run, for the benefit of railroad labor itself. Recognition of this fact, as it affects not only the railroads but many other industries as well, would go a long way toward eliminating one of the greatest obstacles to a revival in basic industrial activity."

Commerce and Finance speaks of the wisdom of "encouraging a curtailment of production until consumption has grown up to it. This, or something that will produce the same economic effect, appears to be the most crying need of the world today." And the New York *Times* refers to a decline of only 13 per cent in a year in the prices of cotton goods, while the raw cotton has fallen 39 per cent, as a case in point between raw and finished materials. But—in extenuation—"print cloths have [previously] been under price pressure, due to overproduction when the staple was selling at a higher price."

"Buy now," is the unusual (but acclaimed) advice to its 249,000 depositors, made by the Emigrant Industrial Savings Bank, New York. "Keep on deposit all you should have as a reserve against emergencies. . . . But if you have a surplus above all likely needs, make careful purchases of things you want for permanent use, while prices remain low." Judicious spending will help set the wheels of industry to turning more rapidly, is the argument, and restore employment to thousands now out of work.

Unemployment is rapidly becoming no less of a bugbear. A "winter of discontent" lies ahead. But *Financial Chronicle* decries the "dole" as something to be execrated. "It is the grand splurge of an Atlas-like government capable of bearing the woes of the world. . . . Is it not the fatal 'problem' of England? In the chancelleries of Europe, how to get rid of it is a burning question. . . . Say what you will, it is an imminent danger. And a Congress which establishes the dole will damn true democracy forever."

Alexander Hamilton Institute tells us that 14 lines of industry have larger payrolls than a month ago, and that August will probably be found to have shown a further gain. But, with prices showing so much maladjustment, if the seasonal increase this autumn "proves to be less extensive than usual, business is going to find conditions during the remainder of the year very discouraging."

Guaranty Trust Co., New York, finds expansion near: The situation in Europe has improved somewhat; there is greater retail activity in the United States [greater wholesale movement also, according to New York *Times*]; increased physical volume of trade "strengthens the view that consumers' supplies have been depleted to a point where more liberal buying is necessary."

New England appears to be relatively happy. First National Bank, Boston, tells us that that section has had less curtailment in business than the country at large. Some of its leading industries are running far ahead of last year and the index of industrial activity is at the highest point since April, 1930.

of Atwater Avenue. Each unit will house six 30,000,000 gal. pumps. J. E. Gauthier is clerk.

City Gas & Electric Corpn., care of Brown, Urquhart Co., Ltd., 266 St. James Street West, Montreal, is considering erection of gas plants at Three Rivers and Hull, Que.

Public Utilities Commission, London, Ont., is receiving bids for a two-story workshop and storage building, 50 x 120 ft. Equipment will be purchased later. E. V. Buchanan, is general manager.

Ashcroft Water, Electric & Improvement Co., has secured rights on Bonaparte River, near Ashcroft, B. C., and will build a power plant to cost $25,000.

Foreign

BIDS will be asked soon by Department of State, Government of Brazil, Rio de Janeiro, for electrification of part of Central do Brazil Railroad operating in State of Sao Paulo. Engineering department of railroad, Rio de Janeiro, will be in charge.

Associated Portland Cement Co., Ltd., London, England, is planning sale of new common stock issue, totaling about £500,000 (approximately $2,225,000), also £150,000 second debenture stock (about $707,500) and £180,000 preference shares (about $873,000), part of fund to be used for expansion and improvements, including acquisition of Red Triangle Cement Companies. Plants of acquired interest will be continued at present locations.

Central Executive Committee, Soviet Russian Government, Moscow, is arranging an appropriation of 900,000,000 rubles (about $450,000,000) for expansion and improvements in coal-mining properties, including development of new mines. Considerable portion of fund will be used for purchase of coal-mining machinery and other equipment. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency. In connection with expansion in meat-packing plants, referred to in these columns last week, Supreme Economic Council, Moscow, is considering erection of new plant for production of special type of refrigerator railroad cars for hauling meats over long distances, works to include facilities for both car and refrigerating equipment manufacture.

Kreuger & Toll Co., Stockholm, Sweden, has begun erection of new wood pulp manufacturing plant at Ostrand, Sweden, to have initial capacity of 100,000 tons a year, to cost over $3,000,000 with machinery.

New Trade Publications

Hydraulic Lift Truck.—Lyon Iron Works, Greene, N. Y. Bulletin No. 105 devoted to the 6000-lb. capacity lift truck, which lifts and lowers hydraulically. Ease of operation is a feature.

Chrome and Nickel Plate.—American Nickeloid Co., Peru, Ill. Folder containing samples of nickel and chrome-plated brass sheets. There is also a list of the company's other plated products, including chrome and nickel-plated zinc, steel, copper sheets and tin plate.